

Volume LII, Number 4, Fourth Quarter 1996

BORDERLANDS

A QUARTERLY JOURNAL OF BORDERLAND RESEARCH

SINCE 1945

Living Water in America

The Nocturnal "HUM"

Design Ecology

Hydrogen Power

Interview with John Major Jenkins

Detecting Biodynamic Signals Pt. II

Vladimir Gavreau's Sonic Weapon

The Cameron "Vri-Stick"

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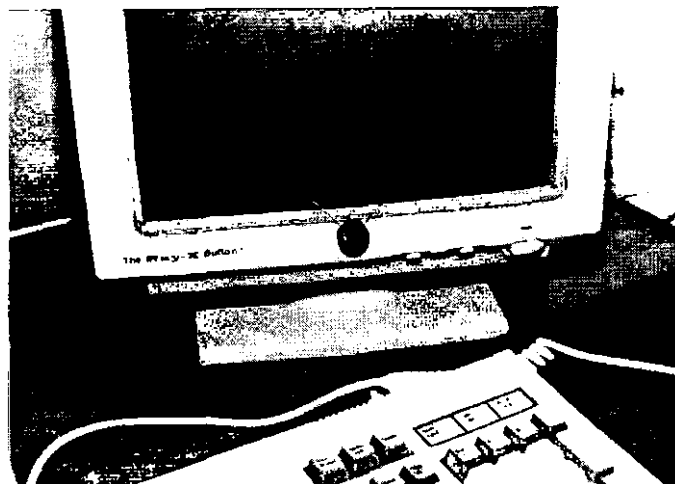
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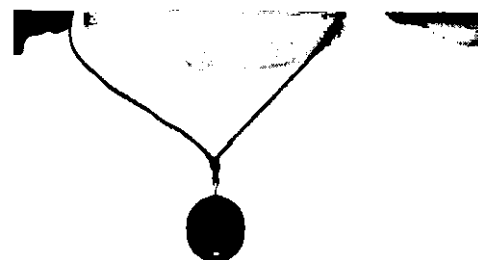
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BORDERLANDS

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VIEW FROM THE BORDERLANDS

Editorial

As we move into 1997 we are confronted with an expanding wealth of information streaming in from innumerable sources. With an increase in published material, and the continuing ease of using the Internet, many are feeling overwhelmed, and it becomes increasingly more difficult for some to sort through it all. The ultimate goal is the acquisition of knowledge from within this information — which can seem a formidable task. But, fortunately, knowledge has its way of coming to the surface when the time is right, and will come through with or without our help.

In the last year we've seen substantial breakthroughs in the qualitative sciences, and there appears to be no end in sight. Recently, after a long search, BSRF has procured the writings and equipment of Borderland pioneer Dr. L. George Lawrence which were thought to be lost forever. Dr. Lawrence was a qualitative scientist of the highest caliber, and ranks as one of the great borderland experimenters of this century. This addition to the BSRF archives is a true milestone.

Another exceptional event was the recent acquisition of two original Drown Radionic treatment instruments, graciously donated to BSRF by Erik de Steiguer. After careful examination of these instruments, it is clear that there are some major differences between the original designs of Dr. Drown, and what is currently held to be Drown technology. In a future issue of this magazine, we hope to outline these differences, and provide a stepwise analysis of the original instruments including procedures for their accurate reconstruction.

Breakthroughs in the revitalization of water have come to the forefront in new technology this year, and have made their mark on countless fields within the qualitative sciences. In this issue, we feature a short, but informative article on water revitalization by Dr. Joseph Lancaster, a true champion of the emerging water revitalization technology. In the next few years, I expect we will see a revolution toward embracing the many facets of this extremely important water revitalization approach.

Many of you have heard it, and some have even tried to record it — without success. The early morning "HUM" which gained popularity from its experience in places such as Taos, New Mexico, and Monterey, California, has been felt more recently in several places across the globe. Gerry Vassilatos treats us to his remarkable insights concerning this phenomenon in "Nocturnal Disturbances and the Infrasonic 'HUM'." His conclusion as to the source of these disturbances is probably the most practical to date, and is sure to raise controversy.

We are assured you will find the rest of the articles in this issue equally fascinating. We look forward to the coming year, and will continue to bring you the finest publication possible. Thank you for your support.



Michael Theroux
Editor

Clips, Quotes, & Comments

Geometry & Weather Engineering

I greatly appreciate the magazine keep up the good work! Reading the Weather Engineering article in *Borderlands*, 2nd Qtr. 1996, Trevor Constable states: "The etheric is manipulated by the geometry of the bulls, the geometry of their insertion into the etheric continuum, and the velocity..." Several points occurred to me:

1) Without knowing the specific "Geometry of the Bulls" involved in weather engineering, it is reasonable to expect that different forms will have a continuum of varying effectiveness, the more or less closely they approximate some ideal effective shape. Forms of any given shape should demonstrate some predictable effects. If a specific shape, cut to some precise "geodetic" measurements produces 100% of the effect, another shape, less exact, should produce 90%, or 80%, etc. For any standard-shape object, some effect would be expected, even though it may not be the full effect of an ideally shaped object.

At the present time, enormous numbers of highly-standardized-shaped objects are routinely "inserted into the etheric continuum", particularly in transport of building materials: bulk shipments of piping both metallic and nonmetallic, bulk shipments of metal rod, bar, and sheet stock; bulk shipments of finished lumber and plywood. These objects should act, albeit inadvertently, as "Bulls" of some sort or other.

These objects, of a limited number of highly standard shapes and dimensions, are routinely palletized-packed, and shipped in such a way that orientation aboard their transporting vehicles is very often predictable. Routine vehicle speeds in any particular transport corridor are determinable. The specific and average compass headings of the transporting vehicles is readily determined for every transport leg.

There should thus arise opportunities to demonstrate measurable and quantifiable weather alteration pattern effects generated by the regular and repeated shipments of,

for example: steel pipe of standard dimensions; from a specific foundry; at standard compass headings, and mostly uniform average speeds along specific roadways; upon specific sectors of countryside. There should also be consistent, detectable effects of vehicle traffic itself, when objects of regular general form (for example, the rather consistent cylindrical shapes and proportions of jet aircraft hulls) repeatedly and regularly traverse the same compass headings at relatively uniform velocities over well-defined corridors.

Specific etheric effects must be produced by the processing or assembly of any standardized-shape objects. *There should be zones of etheric effect detectable* and the objective reality of the effects should be measurable in the vicinity of any such "etherically [sic] manipulated" location. Possible sites for investigation: a post office (standard letters and packages, with regular stacking and routing orientations); a library (standard book sizes, with linear orientation on bookshelves); business or government records depositories (standard file-folders, in linear grids of file-cabinets, currently; standard size parchment & papyrus scrolls, in classical times; standard size cuneiform tablets, in Ur and Babylon); very large structures (the Gizeh Pyramid - standard sized, regularly oriented stone blocks - by the tens of millions).

2) Could the effect of external mounting of "Etheric Bulls" on small aircraft be accomplished also by carrying them inside an aircraft? How about, by simply shipping them, via air freight palletized to ensure their particular orientation to the air-flight corridor traversed?

3) The phenomenon of "sequestration" of attention noted is real; but the idea that overcoming blindness in one limited area confers unlimited vision in all areas is a premature conclusion. The idea that a coming era of "etheric engineering" will be (or could be) characterized by "commercial" exploitation and development, may be illusory.

Serious metaphysical consideration suggests that the exploitative nature of the "commercial development" paradigm may be physically inapplicable to etheric-engineering efforts - the nature of the ether itself may well preclude "commercial utilization" of these effects. The author of the article does not seem to be able to imagine any way other than "commercial" to make the benefits of this science available to humankind.

There do exist alternative models for achieving development: for example, in the culture of classical Rome, wealthy individuals competed for the right to build bridges, waterworks, etc., not for the pay-back of tolls for their use, but for the honor of having made donations to the general weal. Throughout Asia, and even in parts of Europe, individual ascetics and monks excavated hard-rock tunnel-passages for the ease of travelers in mountainous regions, for the attainment of solely religious merit. Co-operative development schemes in the 3rd world also provide possible models - and in exactly those regions that most suffer from extremes of weather, drought, deforestation and desertification.

Could it be, that etheric weather engineering, while in theory profitable in the commercial sense, is simply not amenable to being manipulated for individual or corporate "commercial" gain? The remarkable difficulty and resistance experienced by numerous researchers who have attempted profitable commercial exploitation of these sorts of phenomena, could be the result of orderings of the physical world as a result of *a priori* metaphysical realities. This might explain the apparent (so far!) absence of use of etheric weather engineering for strategic political or military purposes. That absence is glaring, considering that the military/political sector has such ready access to aircraft and personnel for experimentation, and extremely powerful motivation for the investigation.

— Rashid Raymond Patch, San Francisco, CA

Trevor Constable replies:

Referring to his points:

1. Of course it is reasonable to expect that different geometric forms will have different effects. One must nevertheless begin where one can, and preferably where the original discoverer broke through. This, we have done, starting with the cylindrical tubes of Dr. Reich.

From there we have investigated other forms, whose capacity to interact with the etheric continuum is well-established, e.g., cones. Cones and cylinders have been used separately, and in combinations, both statically and dynamically. Many other shapes have been tested in various formats through the years, always with the Golden Section proportion central to designs.

Whether or not declining precision of geometric shapes produces linear decline in results in this work, as Mr. Patch conjectures, I cannot say. One could spend decades elucidating such things, but to what purpose, when precise shapes are the obvious and effective way to go?

I do not doubt that commercial shipments of such geometric forms as steel and concrete pipe, exert effects on the weather. I have several times directly observed such happenings. My reaction to Mr. Patch's proposal that palletized shipments of various geometric forms, in regular commerce, should be tracked and plotted to determine weather modification effects, is that such a proposal is totally unrealistic and irrational. Factoring in compass headings, highway speeds, traffic conditions and so on, as he envisions, would soon bury any etheric effects under tons of mechanistic data.

Extending this proposed analysis to shipments of books, file folders, file cabinets, papyrus scrolls, or to an effort to determine the etheric effects of processing and assembling such geometric forms is not feasible at this time. The cost of any such program would be enormous. Furthermore, if we have learned anything in our work, it is that geometric forms must be entered into the etheric continuum as purely as possible, with minimal appendages for mounting. Bundling, crating or packing geometric forms would certainly scramble and probably nullify their effects. There is no sound reason to make such investigations, whereas utilizing the etheric continuum to engineer and control weather is of obvious value and merit. This despite attendant hazards stemming from dishonest and malicious human beings.

Let me point out also, that in our early work, we entered tubes into engineering work in random diameters and lengths,

sometimes using as many as 150 such tubes. This produced such vast effects we could easily detect and analyze them. As time passed, and we learned more, these massive batteries were supplanted by ever smaller units right down to the size of a coffee mug. So the processes Mr. Patch seems to be reaching for, have been developing over the past 28 years.

2. Etheric translators about half the size of a human head, but not the 4-ft long Bulls, have been carried inside an aircraft hull, circa 1991. They work there, with grossly tangible but highly undesirable effects. There is a difference between 70mph at 1,000 feet, and 500 mph at 35,000 feet, and as I have so often said, velocity is a multiplier in mobile operations. Mr. Patch's passion for palletizing things, is not necessary in airborne applications, which are proceeding one step at a time to maintain control of such operations, and to directly observe local effects.

3. Repeatedly I have emphasized that the coming epoch of etheric power will have to be undergirded by a new kind of financing, and a new type of financier. Such things will duly eventuate, and we wait more on them than we do on inventors with new ways to power our civilization. There can be no enabling of satisfactory fusion of these radical new technologies with the old greed-driven order and its compulsive criminality. As far as commercial development is concerned, nothing effective will eventuate nevertheless, without the application of modern business methods. These methods already exist and are proven ways to get things done. In partnership with the coming etheric technology, they will be purged of the criminality that pervades commerce and politics today. The methods themselves are an evolutionary development.

As far as Mr. Patch's assertion that I "do not seem able to imagine any way other than 'commercial' to make the benefits of this science available to humankind," merely signifies that he does not know me very well. I have toiled in the etheric vineyard for over 40 years, and have carried out my version of the ancient tunneling monks he cites, with every bit as much energy and dedication as those estimable Holy Judges. In the article that Mr. Patch seems not to have fully read,

I sketch the type of human beings, and their qualities, assets and motives, necessary to carry the work on into the world. We were driven throughout by the principle of service to others. We can expect to see businessmen and businesswomen begin appearing who will have similar drives, along with the abilities necessary to play their part in the transformation of the Earth. Solid, sound business methods are a vital part of all this.

-TJC

HAARP with No Strings

I am a new subscriber to your wonderful magazine. I was in Alaska when the testing of the Borealis first began. I met a few of the engineers who performed and recorded some of these tests. This was done by projecting explosive charges into the atmosphere and having them simulate the borealis. One of these engineers was very good at chess and we had many a game while he was in Homer preparing for the tests. The one test I saw was spectacular and much better than any 4th of July show. He told me there were no ill effects to be had by anyone from the tests and that *they were interested in finding out if there were any electrical charges in the atmosphere that could be used for energy purposes during the time of the borealis*. By producing the tests during the summer months, they could control the spread of the borealis itself and collect the necessary data they needed.

The test I saw was the formation of a large red ball in the sky a few hours before dark over Homer, Alaska followed by a horizontal spreading of the light. There wasn't any noise associated with the explosion. As the light spread across the very clear sky, it later formed into mostly blue and green colors in a vertical formation covering most of the sky looking from west to east, about the same as you would witness a regular borealis only larger. It was very beautiful and bright. I can't really tell you any more than what I saw. I figured that if they could excite the atmosphere as such on a continuous basis, they could keep the entire sky lighted. My engineer friend did work for a private company, but I don't remember which one.

- Tracy Jones, Shoreline, WA

HAARP With No Meat?

I want to make an exception to the HAARP story in *Borderlands*, 3rd Qtr. 1996 issue. After plowing through this lengthy article I felt I had been treated to the blurb for a book. There was NO MEAT, only repetition after repetition of criticism of conspiracy people. The subject could have been covered in 3 pages and something concrete presented in the other pages.

I don't plan to buy the book so my knowledge of HAARP, which looked so promising in your heading, is almost zero as far as getting it from your magazine.

— D. Lessner

Vassilatos claims to have studied all of the literature about HAARP. However, it appears that he has failed to study the environmental impact study, by the military, where they admit that the HAARP instrument causes the temperature of the human body to increase at a distance from the HAARP instrument. In other words, the HAARP instrument induces an artificial fever from a distance. In still other words, the HAARP instrument over stimulates the immune system from a distance. This sure looks like a weapon to me.

— Gerald Lindley, Manchester, CT

Gerry replies:

I am indeed fortunate to have a readership which thinks enough of my writing to contact the Journal in reply to critical points in our continuing dialogue. Nothing could be more important than our consistency in maintaining the conversation of scholarship. But, my "long" article has stimulated a small and surprising controversy. Some persons have recently expressed the belief that scholarly writing of this extent does not fulfill the needs of the scientific underground, who are better served (they have stated) by short summaries.

But this demand has stimulated my own criticism, and I trust that you will again allow me to pour out a dialogue on this matter. The desire for quick summaries of dialogues, those dialogues which are resolutely philosophical and complete, is an attitude typical only of a decadent technological society. To find this decadence poisoning

the waters of our scientific underground is a real surprise. Only a society in which the quick making and buying of machines outvalues the "conversation scientific" would criticize "thoroughness" and call it "banter".

Yet it is precisely in the dialogue of scholarship that minds are trained to think and work in otherwise unfamiliar metacognitive directions. Has philosophical dialogue finally been considered antiquated and unnecessary? Nowhere can such a notion be allowed. Science is dialogue with the metaphysical, a process which is arduous, laborious, and necessarily lengthy. It requires the utmost patience, inner reserve, and thorough devotion. And while I am now impelled to comply with the requirements of my readers, I am not a small bit displeased by the suggestion that scholarly thoroughness is "a waste of time". But critics have an easy dispassionate task, while composition is passionately difficult. Feel free to write as much, if you choose to engage just such a dialogue.

The long HAARP article was designed to introduce you to a wide spectrum of related topics. The article was indeed a methodical succession of considerations, and designed to stimulate dialogue. The many points no doubt touched off a small conflagration! As I was quick to point out, far too many socio-technological issues have focussed in on Project HAARP than coincidence will allow. Indeed, the HAARP Project has focussed social consciousness in a magnificent way. This is evidence that the very conscious infrastructure has been placed on alert as it were.

But the focus is not on the danger believed inherent in the HAARP Project itself. The greatest danger, the true source of hazard concerning HAARP, has already displayed something of its power. We should not be worried over the release of 100 Gigawatts shortwave energy in HAARP or any other such project. It is the consequent reaction by the biodynamic stratum that engineers should fear the most. Being at the focal point of natural catabolic process, the Gakona site will become a scene of dramatic evidence that Nature abhors a vacuum...a biological vacuum produced by the release of electrical irritants into an unfathomable

biodynamic stratum of such power. We may well expect a disaster at this site, one which will exceed the ORANUR disaster at Rangeley, Maine in 1951.

HAARP is another kind of technology altogether, but it is definitely not a weapon. Certain private sources have already confirmed my central thesis concerning this very thing. But, the new book does not concern itself entirely with HAARP. It is chiefly concerned with the methodic and successive deployment of technologies which far exceed HAARP as a weapon. For sheer vulnerability, HAARP is an easy target. As for the notion that military operators can wage an electromagnetic war against any target...both the *Cold War Secrets* text and its companion, *Declassified Patents of The Cold War and SDI* (available soon from BSRF — see page 35), will help dispel all of your objections. The entire thrust of military is spaceward.

Previously unrecognized weaponry and communications systems are presently in place. Highly isolated orbital stations which can target any location with ease now patrol the skies...from above. Why would a government which governs deep orbital space, waste time on the building of an easily targeted monstrosity as HAARP? Indeed, why are global cartels pouring their financial support into the project? But these are issues discussed throughout the new book. The long article was a preliminary schematic, one designed to initiate deeper and more thorough dialogues on military technology. The article was not simply a "hype" to impel your purchasing my book. Nevertheless, I believe you will find the deepest kind of answers in both the *Secrets of Cold War Technology* and its forthcoming companion reference text.

— Gerry Vassilatos, Staten Island

Home Health Care

The Home Healthcare article was right on time and a small local clinic had found the Clark zappers ineffective... although her stimulus to get us all debugged has made her a hero to many of us. To go a step beyond colloidal Silver... is wise at this time because some elite factions are cooking up virus

strains that even Silver won't touch. They make them up with their caps held in place with metals like zinc, copper and titanium and try to get them immune to the antibiotics now available. Gold seems to aid the effectiveness of the Silver and colloidal gold has long been favored to get the neuron circuits back to par again (Alzhiemers and nerve damage). Persons with the little silver generators can attach a little gold & copper to each plate to get a trace of these metals. A small Mexican gold coin has a little copper in it and is ideal for this use. A plastic coated hair pin or similar item can hold the coin in place. They seem to have dropped zinc after '95, but I send for colloidal Titanium from New Gaia, PO Box 27710, Las Vegas, 89126 & consider it just a part of surviving these days. For calcium I squirt a little colloidal Silver in milk to zap the bugs and add a dash of Horsetail or Joint grass juice (Put in blender and strain through stocking). Cedar berries get the glands in shape after diabetes. As you observed there has never been so many health answers available.

In regard to arthritis I was told by a typical chiropractor that it would take months of adjustments to help a calcium build up in one of my vertebrae. Putting together a calcium removal herb formulation, I was back in the saddle in one week. Keep up the good work.

— Tom van Doren

Regarding the third paragraph on page 19 of Lindemann's article, "Breakthroughs in Home Health Care" (*Borderlands*, 3rd Quarter, 1996), He writes, "Clark has not understood...the appearance of harmonic frequencies in a square wave." The Clark "zapper" circuit does not generate a classic, symmetrical, astable, square wave, but instead generates a 100% positive-offset pulse-train wave! That wave-form does not produce harmonics. The basic form of a frequency that generates the "appearance" of a harmonics-producing square-wave, is a sine wave with its alternating character.

As for the frequency of the Clark circuit, it is about 30 kHz not 14 kHz. How significant can the "skin-effect" be at that 30 kHz (or even 50 kHz) relatively low frequency?

Dr. Clark should be permitted to re-

spond to Lindemann's article.

— P. Vincent Petrosino

First of all, I would like to address your comments concerning the Clark Zapper, as it is clear that there is a misunderstanding concerning some basic fundamentals of these circuits. Mr. Lindemann was obviously referring to square wave pulse trains when he said "square wave," and a 100% positive-offset pulse-train wave IS a "square wave" pulse-train in this case. In electrical appliances, the total frequency (built up by the resonance of harmonic frequencies) is referred to as the pulse repetition rate. With any pulse waveform (square, rectangular, triangular, etc.) except a sine wave (as the frequency is the same as the pulse repetition rate), there are an INFINITE NUMBER of harmonic frequencies generated in each pulse.

To address the "skin effect" problem, it is well known that low frequencies penetrate greater depths of tissue than high frequencies. Higher frequencies are limited in their penetration because the resistance of tissue acts like a faraday cage, forming eddy-repulsion. This eddy current produces a back EMF and blocks penetration. This is simply the "skin effect", and the higher the frequency, the greater the rejection and shallower the penetration.

Mr. Lindemann's main point was that the Beck unit's output possesses bi-phasic characteristics (current that reverses polarity each half cycle) — the major difference between the two units. Living tissue is easily polarized in a direct current or positive pulse-train field (as ions dissociate by electrolysis), and this polarity stress is quite dangerous to neuronal tissue. By reversing polarity each half cycle, the bi-phasic unit actually balances the polarity so no damage results.

I understand from one of our readers that Dr. Clark has been sent a copy of this article. We do hope that she does respond to this. You may note that in Mr. Lindemann's article, he states, "If you have not seen this book yet ('The Cure for All Diseases,' by Hulda Clark, PhD), definitely buy a copy...In spite of [the] drawbacks and cautions, the book has a wealth of information in it about parasites, and environmental toxins, and should be on everyone's bookshelf."

I must say that all this "zapper" technology is nothing new. I refer back to Dr. Albert

Abrams' "Oscilloclast" treatment instrument, which seems to be the mother of all "zappers." Abrams' Oscilloclast employed a series of extremely feeble, highly damped "oscillating" pulses — a sort of pulse-frequency modulation of oscillations. This is certainly different than current zapper technology, but it is easy to see the similarity. The Oscilloclast produced three kinds of energy too: short wave, an impulse excited damped wave, and alternating magnetic energy. We will be covering more information on this in future issues. Stay tuned for the reprint of Thomas Colson's "Oscilloclast Energies" in the next issue of *Borderlands* complete with diagrams and schematics.

— EDITOR

Etheric Condenser

Reading the Lakhovsky MWO Handbook I was intrigued by the Al Goeke piece on page 75 showing the sketch of the etheric condenser, a device using alternate layers of charcoal and granite as a source of etheric radiations. While nothing is said as to the type of charcoal or granite, I found it curious that similar layering methods were used to construct many of the thousands of earthen mounds dotting the Mississippi basin.

Of particular interest are the conic mounds in the Ohio Valley. These ancient constructs were located close to running water and the site was cleared then covered with a thick bed of hard-packed clay. On this, tons of local material was compacted into a cone-shape then covered with a thick layer of clay. Over this a second cone was constructed in the same manner and these alternating layers continued until the fifth layer reached a hundred or more feet in height.

What is important here is that at some point near the bottom one or more inscribed stone tablets (often granite) were included while in the upper levels were stones with symbols, even a thick bed of charcoal. Equally important is that, while local materials were used as fill, the clay and tablets were usually of non-local material which needed to be transported to the site, usually over long distances.

If these were simply high-rise graveyards for the body of the local boss...and indeed human burials were found in many mounds...what purpose was served by the

inscribed tablets? It seems unlikely that they were grave stones. And what about the other stones with symbols and beds of charcoal? For that matter, why haul special materials from some distant location when a nearby supply was available?

The reason may be that, since many of these sites were said to be sacred places used for physical healing, the location itself may have provided beneficial radiations of an unknown character and source somewhere inside the earth and the outflow may have required modification and control to be suitable for healing. The role of the special layering and their location in the construct may have provided this.

If indeed something of medicinal value emerged from the earth at these special locations, our present day science is still not aware of it. The only clues available are the ancient native legends such as that of the Sacred Turtle which tells, "The earth is the turtle that gives up its eggs to the serpent who consumes them and is rejuvenated." This act is depicted at thousands of locations around North America where early native art depicts turtles surrounded by eggs and serpents swallowing eggs.

So were these huge conic mounds intended to represent eggs with their pointed end up? Did the serpent here represent the Kundalini, or latent power in the human body as in the Far Eastern teachings? Did the five layers in these mounds represent the five "Chakric" centers in the trunk of the human body which were the ones treated in the physical healing practiced in the Far East?

We have no answers to these questions. Maybe one day someone will have the time to examine these ancient works and analyze the specific types of materials and the spacing between layers and find answers. Who knows, maybe they will discover what made these sites special.

In the meantime much might be learned from devices such as the one shown in the Goeke article. Since it seems to provide some positive effects, varying the types of materials being interfaced and their thickness might result in some improvements. Even a scaled down model of these ancient constructs might provide important clues as

to what ancient engineers were up to.
— H. Cochrane, Toronto, Ontario

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Living Water...

in America

by Dr. Joseph Lancaster

ON a cold winter evening several years ago, a knock on my Country door in the foothills outside of Santa Fe began an adventure I truly believe will never end. The knocking hand belonged to a lost traveler. After spending considerable time trying to unravel the mysteries causing the separation of the traveler from her appointed destination, all was revealed and she happily found her way. Interestingly enough, the next night produced a return visit from the again lost traveler, who this time was rapidly dispatched to the correct location.

Several nights later the traveler appeared again at my door, this time to share some information as a "gift" for my patience and aid earlier in the week. She produced a small cylindrical object of respectable weight, and announced its purpose was to normalize and re-energize water. Although mildly amused, having researched numerous technologies over twenty-five years that never lived up to their claims, my still naturally curious mind opened to challenge. As I held the object in my hand, the enviable weight steered my senses to another level of activity within. My blood began to race, my respiration increased, a heat began to rise in my system that was always an indication that I was face to face with something important. I poured some of my tap water (from a pure source 350 deep well) through the unit and drank it. It was indeed different—cleaner, wetter, stronger. I took samples of straight tap water, "altered" tap water, bottled drinking water, "altered" bottled drinking water, distilled water, and "altered" distilled water, randomly coded them, and presented them to my then partner, one of the world's finest medical dowsers. The results were definitive. The "altered" samples of water were dramati-

cally higher in vitality. The highest readings were from the "altered" well water, followed by the bottled water, and thirdly the distilled water. My curiosity was soundly aroused. After some discussion about the origin of this technology, called "Grander Living Water", my visitor gave me a contact number in Reno, Nevada, and left.

Early the next morning I made contact with the U.S. distribution center for the Grander products (now defunct). I asked them to send me everything they had on the technology, and a list of everyone in North America dealing with the products. I ordered a 3/4" household unit, and signed a contract to be a major distributor in the U.S.

I became consumed with the search for information and experiences with the Grander units, and compiled several coiled books, one on the philosophy and explanation of the technology, and another on testimonials—personal and commercial. Although excessively time-consuming, this project was essential, for there was no real information to be had from the manufacturer or the distribution center. A call to the manufacturer in Austria produced the reply in halting English: "You will have to find out for yourself what it can do." That enterprise is ongoing and gathering steam at this writing, considerably aided by a European best seller book, *On the Track of Water's Secrets*, which has an initial few chapters on Viktor Schauberger and the rest on the work of Johann Grander.

What then is the story on this "Living Water" technology, and what are its implications for our environment? Much of the story is available in the afore-mentioned book, *On the Track of Water's Secrets*, as well as in a booklet produced by the Austrian manufacturer, entitled *UVO: Living Water by the Grander Technology* (UVO being the European marketing agent for the Grander products). However, for our present readers, a brief outline is of value.

It has long been known to students of nature that water is more than the approximate 2/3 of our human makeup, the

90% of some animals and plants, and the 70% of the earth itself. It is the mediator between the etheric and physical worlds. It is a tremendous communicator. It picks up information through vibration from everything it comes in contact with. It is further supplied with information from our solar system. When "healthy", water has the capacity to self-cleanse, to supply energy for living things, and to assist in removing waste products, even from the cellular level. Our more observant physicians over the centuries have advocated the use of water as one of our greatest healers. Readers may be acquainted with the recent work of Dr. Batmanghelidj, the Iranian physician who has developed a medical practice based on the curative powers of water.

What has happened to this wonderful life-affirming element that Lao-tsu in the 6th Century B.C. called "the emblem of supreme virtue"? Simply put, we have desecrated it. We have forced it out of the ground before it is "ripe". We have confined it under pressure through miles of pipe. We have exposed it to staggering environmental pollution, and then added grand quantities of harmful substances to it to "clean it up" for human consumption again. Those who follow the purification of water past its surface theoretics know that the unfortunate truth is that although we may achieve chemically "pure" water, the vibrational frequencies of the contaminants and discordant activities that the water has been put through YET REMAIN IN THE WATER and negatively influence all living functions! It was to this very problem that the Austrian naturalist and inventor, Johann Grander, turned his attention over a decade ago. It is his honor to have found a way to "restore the information water needs to reconstruct all the energy it has lost", to replace the accumulated negative vibrations with a higher, life-affirming vibration. This he has done through the implementation of Implosion technology. The "energized" fluid that he put in his water units, (as well as in his pendants for wearing, penergizers for stirring fluids, and his rods for wells, manure lagoons, ponds and lakes), transmits vibrational information (not energy itself) to the water around it. The implications and applications are profound. The Living Water units have not diminished in effectiveness over the past ten years. They are used throughout Europe and more recently in the U.S. and Canada. They are used in residential,

commercial, agricultural, and natural settings with intriguing results.

My own passionate interest is in the revitalization of lakes and ponds. This past July I had the opportunity to experiment with a 1-2 acre pond in northern Indiana. The fish had all died (despite restocking). The pH was 10.8. The pond was filled with 3 main types of algae, which had suffocated it. The pond had been subjected to years of agricultural run-off, and sediment had accumulated to the depth of 3 feet or more. It was my estimation after installing the rods and a commercial-sized unit through which we pumped the pond water 24 hours/day, that it would take a month or so to see any improvement. And yet, within hours of beginning the project,

we began to see results. Great swirls of white foam began to form in the center of the pond. Testing indicated that the pH was already dropping. Five days later I received a call notifying me that the pond was clear to the bottom! The pH was 7.6, the algae had disintegrated and was all gone except for a small ring around the edge of the pond, and people were swimming in it! I have since seen other similar responses with Grander Living Water technology, and am at present negotiating with several municipalities throughout the U.S. to conduct formal research scenarios in cooperation with the Department of Natural Resources. The sky is the limit in the potential of this technology, and the application is just in its infancy.

Perhaps further articles might speak more about the profound effect these units have on household and commercial water use. Until then, let me say that out of the myriad of water "treatment" approaches being investigated, I have found the Grander technology to be the most profound to date. The fact that

every gallon of "revitalized" water helps to turn over at least 10 gallons of distorted water it comes into contact with, has encouraging implications for our environment. □



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NOCTURNAL DISTURBANCES...

AND THE INFRASONIC "HUM"

by Gerry Vassilatos

THE following essay offers a new perspective on phenomena which have captivated national interest for several years now. This perspective is the result of a continual observation of the phenomenon, with a concomitant effort directed toward elimination of many of the associated local neuralgia effects. The article is not intended to represent a completed experimental project by any means, but is merely an introduction to the topic area from a more definitive vantage. It is hoped that a renewed experimental research may determine the exact details of the HUM phenomenon along these more clarified avenues of thought. It is noteworthy that, in every aspect, such phenomena mirror those which compelled Baron Karl von Reichenbach into his legendary researches. The fruits of such study contain equally prodigious and monumental discoveries, an encouragement for those who will seek and find.

A great host of individuals throughout North America and Northern Europe have reported the reception of nocturnal auditory disturbances, collectively termed "the HUM". No modern text offers explanation for the national mystery. It is for this reason that we will collate some of the subjectively discerned phenomena, empirically observed effects whose nature offers us the clearest direction toward understanding the HUM source. The HUM is heard by an increasing population of persons who are awakened nightly by its annoying and sometimes painful performance. So panregional have these reports been, and so credible the observers of the phenomenon, that one is compelled to affirm the existence of the effect. While the objective data received through reliable reporters may realistically be questioned in moments of scientific doubt, one is convinced of its reality after encountering the experience firsthand.

The HUM represents several simultaneous anomalies for those well versed in the lore of natural anomalies, an audio phenomenon which challenges the very basic notions of sense, perception, and world process. On the validity of personal experience and experimental verifications of a precursory development, I have therefore decided to make several statements concerning the HUM phenomenon and its associated effects. Indeed, I have also chosen to elucidate somewhat on the HUM to provoke dialogue between the mechanists and the biodynamicists.

NOCTURNES

There are an increasing number of individuals who experience nocturnal disturbances, the regular occurrence of which is suffi-

ciently powerful to remove them from deepest sleep. This growing population of nocturnal risers neither suffer from the physical symptoms normally associated with the aging process, nor are among those unfortunates afflicted with clinical insomnia. In many cases, the victims of the malady are quite young and otherwise in complete positive health. So insidious is this social manifestation, that many are stimulated into fantastic speculations. Nevertheless, we perceive an ever increasing population of new HUM victims whose numbers grow daily.

Conspiratist writers have associated the HUM with military projects such as SANGUINE, or HAARP; concluding the insomnia to be a test of psychotronic weaponry on the national population. Such symbols of the subconscious national fear might have too long worked their way into the hearts of the susceptible, were it not for the simplest kind of evidence concerning the HUM. Curiosity and the need to know far exceed any orthodox standards, filters, or approvals. The absence of extensive measuring tools does not preclude us from making our assessments on an overwhelming phenomenon which academia continues to ignore and deny. Gleaned from the few writings and from numerous dialogues with qualified observers, we are free to share our own subjective consortium of data on the HUM.

But what is the "HUM", and what are its effects? What causes the HUM, and why has it seemed so very impossible a phenomenon to objectify? Are there means by which to obtain hard evidence of the effect at all? Can we indeed discover those connective touchpoints between our subjective experience of the HUM and its true sources in the external world? Is there a measurable continuum between our innermost experience and the outermost world? These are hard and straightforward questions demanding equally hard answers. The HUM effect is indeed a "phenomenon-extraordinaire". The HUM is a subjective experience, a deep and permeating tone which comes in pulsations. But it finds connectivity in an external stimulus, one which has not successfully been found by most researchers.

On certain nights, the disturbance reaches peak crescendi. These are interspersed by quiescent moments, when the roaring vibrations seem to relax and vanish for a time. Soon the phenomenon reasserts itself, and the "roar" once again reaches its previous powerful volume levels. The HUM is evidence of a regional phenomenon, a geomantic effect. The HUM phenomenon has slowly gained recognition among a substantial population of well equipped researchers, many of whom cite government ELF projects as the probable cause.

HUM effects have been viewed as "leakage" phenomena, the results of local geological ELF conduction. Emerging from its otherwise subterranean conduction strata, researchers have believed the effects wholly due to NRL SANGUINE broadcasts. Local HUM experiences begin as very occasional manifestations, manageable and non-incursive.

To satisfy the skeptical dictates of the orthodoxy many have eagerly sought the supposed local acoustic noise source, imagining refrigerator motors to be this probable cause. On hearing the loudest HUM manifestations, not a few researchers are surprised to find their household refrigerators have usually ceased functioning for the night. Despite this complete absence of a close physical acoustic source the HUM is not prevented from suffusing an entire house. One may move from room to room when the HUM manifests its presence, discovering that the humming sound finds its greatest resonant magnifications on lower floors.

Rooms each mysteriously modify the main throbbing sound, adding discernible harmonics to the main HUM tone. This is especially noted when HUM events overwhelm our sense of hearing. Moving from an outer wall into each interior room of a building, one hears distinct HUM pitch changes. Hallways and small alcoves raise the pitch considerably enough for astute observers to take notice. In addition, HUM volumes change considerably with progressive movement away from outer walls, evidencing both the directionality of the local HUM source and the effect of blocking. Because of these observations, first HUM analysts imagined the phenomenon to represent a purely acoustic effect. It was in these first "acoustic" considerations, and the subsequent empirical discoveries, that the HUM was realized as a completely anomalous phenomenon.

The HUM throbs asymmetrically in time, a volume which "flutters". One may explore the effect throughout the early morning hours of its usual activity, each such emergence offering fresh opportunity for study. One grows familiar enough to know when the HUM has mounted a sufficient power to rouse normally insensitive persons from sleep. The comments of others concerning their own nightly disturbances is sufficient corroborative evidence that the HUM has actually made itself regionally known. One is not greatly surprised to find that many neighborhood friends and acquaintances, while exhibiting some degree of discomfort in sleep, are often not roused by the less powerful HUM incidents. Individuals who suffer from this habitual awakening apparently experience the HUM in various degrees.

There are those who demonstrate varying degrees of awareness concerning their insomnia. Some have claimed that the HUM is more strongly felt by the more sensitive kind of individual only during their sleep periods, and that insensitives are not bothered by the disturbance at all. Nevertheless, normal sleep for some is absolutely broken by the HUM. The simple and mild audio-related awakenings gradually become an habitual condition, and some unfortunate persons have found themselves now rising nightly in a chronic insomnia which rules their sleep patterns. But this is not where the effects have ceased their incursive influence on the lives of those exposed to HUM events. In fact, some who experience HUM-related insomnia have begun observing a sudden shift, both in the frequency of their HUM observations and in new accompanying effects.

There are certain persons whose simple audio HUM experiences have recently been accompanied by a range of strange physical irritations. At first mildly stinging, the irritations gradually become an ever increasing flow of neuralgia which floods the musculature of arms and legs. For these persons, this peculiar neuralgia now accompanies every manifestation of the audio HUM. With effects which persistently linger throughout the daylight hours, certain such persons have actually fallen victim to a strange condition which leaves them fatigued and debilitated with every morning. Both the symptoms and conditions have remained unrecognized by physicians for reasons having entirely to do with insensitivity, ignorance, and willful denial. These irritations then represent a relatively new feature of the HUM, one which challenges analysts and skeptics alike.

It has been reported that extreme HUM events stimulate unusual personal responses. During such episodes, the neuralgia provokes survivalistic tendencies of a kind approaching those induced by asthmatic attacks. As neuralgic pain increases, personal movement becomes more conservative, efficient, and comfort-oriented. HUM neuralgia effectively stimulates deep seated survival instincts which, in its most powerful manifestations, become autonomic responses. These responses are of a depth which completely eliminate all degrees of personal freedom. This irritation literally induces the "feral" or "fetal" response, a sure sign that penetrating irritation has reached the central nervous system. A furtive sleep seems to follow these initial survivalistic arousals and maneuvers. The unfortunate individual who now suffers in times of extreme HUM disturbances, seems controlled by very fundamental and autonomic response-reflexes when in its grips. Such sufferers may behave in semiconscious modes, modelling behavioral patterns seen only in animals.

In the sometimes painful episodes brought about by the HUM, the self-survival drive becomes a tool for the most revealing kinds of studies. In the throes of HUM related neuralgia, hypersensitive individuals will seek the lowest portion of a house. In fact, they will seek relocation in the very basement of a dwelling if possible: the deepest connection to ground. In extreme HUM events, hypersensitive individuals "curl up and sit tight". In these fetal reversions, the human body innately recognizes the HUM as a hazardous and unfamiliar agent. The response is one having utmost significance for HUM researchers. In this severe and permeating "feral" response, it is clear that the HUM represents an external unfamiliar irritant. In this semi-catatonic posture, it becomes rather obvious that our normal repertoire of survivalistic reflexes does not include an appropriate autonomic response. The HUM triggers no protective neurological reflexes...because it is completely unfamiliar to the human condition. The HUM is very clearly a recent manifestation in the natural environment.

AUDIO

The HUM can be deafening for those who have grown particularly sensitive to its manifestations. Such subjectively excessive HUM experiences stand in stark contrast against the hard fact that the HUM cannot be recorded by any ordinary means. It is precisely this incongruence which represents the major impasse for anomaly researchers. Indeed, there is an inference in these considerations which places doubt on the reality of nocturnal HUM disturbances and their associated effects. The inference however does not in any

way reduce the growing numbers, who both sense and suffer from the HUM.

The elusive and frustrating HUM had first prompted many to begin testing the reality of their experience through conventional audio techniques. Waiting for each peak nocturnal HUM manifestation, researchers attempt its capture on magnetic tape. Previous to this decade, the infrasonic detectors of Vladimir Gavreau very successfully sought and discovered numerous unsuspected natural and synthetic infrasounds. Adapting special PZM type microphones to magnetic recording technology, contemporary researchers fully expected to capture high volume HUM tones with their equipment. Mounted on large surface areas, these microphones should have absorbed sufficient sonic energy during HUM episodes to render powerful audio registrations of the same. In controlled settings, where PZM equipment was designed to select infrasonic signatures, professional investigators remained utterly unable to trap the HUM. Neither PZM nor any other microphone, however sensitive, was able to sense and record the HUM. It was this inability which yet forms the basis of a real scientific mystery, one which places the HUM in its recent controversial poise.

The inability of recording the HUM has, for serious HUM researchers, attracted the derisive public commentary of several academic authorities. Not only can investigators not locate the source of HUM audio signals, but researchers have been unsuccessful in explaining how high population observations and corroborations of HUM phenomena resist audio registration. Examiners of the great natural variety of infrasonic generators yet actively explore and monitor their prospects with greatest enthusiasm and care. Self-funded, but sparing no expense for their labors, several research teams have independently taken their state-of-art recording equipment down into the deeper parts of the earth. Hiking for miles into subterranean caverns, their search of real infrasonic resonant cavities has produced no conclusive result. Too many neophytes, convinced that they will be the ones to secure hard recorded evidence, are completely dismayed after repeated failed efforts in these regards.

While some groups have reported an increase in subjective HUM experience with increasing depth below surface level, they have rarely been able to record or correlate any associated audio HUM. By attaching sensitive transducers directly to subterranean cavern walls, the weak physical vibration of geological bedrock has registered weak signals for some. But these studies have produced no real correlations between subterranean infrasounds and the HUM proper, certainly no equivalent pulsating ELF audio signals. Additionally, neither pounding surflines, waterfalls, howling caverns, nor valley windtunnels have managed to procure correlations between their infrasonic outputs and the HUM.

Thus far, hard recorded evidence of the HUM phenomenon does not exist. But in the absence of audio recorded evidences, one must resort to alternative detection techniques. Methods used in a former series of investigations have described ground conduction apparatus and ground antenna technology (Theroux, Vassilatos). And it is here that we do find evidence of an electrical component in the HUM phenomenon. What place this electrical component plays, whether source or by-product, will be discussed further along in our study.

There are several means by which we may register audio signals

which correlate strongly, if not identically, with regional HUM activity.

It is perhaps a special trait of shortwave receivers, those which have been equipped with ground antennas, that a host of different static signals may be found throughout the day. These variable static signals are always observed through the implementation of ground antennas. Shortwave correlations of the HUM have been determined along several wave bands, the excessive noise found in the 2 to 4 megacycle band being most impossibly distorted for use. For trained ears, these static signals represent the articulate variability characteristic only among biological processes. One discerns these biological warbling signals when working with plants and Galvanic Skin Response audio sensors. The warbling tones of plants teach the astute observer to recognize the characteristic biological signature in any signal. The static variables to which we refer are unmistakably biological in character. These naturally generated signals are found across a wide range of frequency bands, finding their correlation among several simultaneous settings. And it is among these signals that we learn an amazing fact. Most of these natural static signals have an overwhelming volume and do not reveal any of the variable "warbling" artifacts common to the audio experienced HUM effect.

The most useful shortwave static signals are extremely discrete in bandwidth, but do not commence manifesting their warbling variables until certain hours of the day. Indeed, these static warblings commence and correspond exactly with HUM events. These signals evidence a volume variability of great detail which may be examined throughout each of their more active periods, a simple and accessible means by which to monitor and verify the reality of the HUM.

Between the hours of 9am and 9pm, one does not generally discover the pulsating portion of the static signal, although there have been exceptions to this rule. The warbling commences as soon as subjective experience of the HUM commences. They also cease to a featureless static background when the HUM ceases. Such discrete static signal stations are featureless and relatively flat throughout most hours of the day, but the variable pulsations begin appearing after 9pm. These build in crescendo until the peak nocturnal HUM effect naturally occurs between 2:30am and 3:30am. There are thus six hours, both leading to and following the 3:00am median, in which the warbling HUM signal actually makes its appearance in an otherwise natural featureless static.

The variable pulsations make their daily appearance, however with neither clock regularity, nor with equal intensity. One observes exact correlations between the experiential audio HUM and the shortwave warbles. These shortwave correlations match both in pulse number, tone, and intermittent surges. Such static is normally taken by listeners to be simple natural noise effects, the results of natural charge building phenomena. But, the variability of these specific static signals, especially those whose effects seem most powerfully able to modify emotion, represent far more than the mechanistic earth process of charge development. It is in the warbling variability, the articulate detail inherent in these specific static signals, that we find evidence of biodynamic process.

Indeed, were the subjective HUM effects simple audio stimulations, the irritating pressure would not be so very permeating and painful. Infrasound does not prefer windows to walls, effortlessly passing through whole structures and finding resonant cavities

within the interiors of buildings. The HUM diminishes with progressive movements deep into building interiors. Were the HUM the result of an infrasonic audio power source, it could obviously then never permeate physiology enough to stimulate neural aggravations. But the "feral" self-survival response infers an energetic aspect which far exceeds those forces normally considered in closed orthodox circles.

PHYSIOPHONIC ENTRAINMENT

Every model which presupposes the development of mechanical vibration through electrical stimulation completely fails. The necessary ground surface effects of such propositions are absent, further contradicted by the empirical observations. The actual subjective experience of the HUM is very different from all attempts at elucidating its objective existence. It is experience, subjective evaluation, which has produced the most amazing assortment of HUM related discoveries.

First, the tonal characteristic of the HUM itself contradicts all of the conventional suppositions concerning extra low frequency currents. The HUM arrives as an audible tone which pulsates at a countable rate. In other words, the fundamental HUM tone itself is not a superlow audible pitch. People hear the HUM. It is within the range of human hearing, and cannot be the product of ELF generators. This contradiction adds weight to the argument that HUM phenomena cannot possibly be the result of deliberate ELF experiments or industrial electric by-products. There are some who seek explanation of the effect as an upper harmonic of a more fundamental ELF signature. If so, where is that signature? None have been measured.

One seems never able to escape the nocturnal phenomenon, however poised or positioned. When it is heard, the HUM seems to permeate and suffuse every part of a building. The HUM seems to pressure into a house from all walls, yet evidences a defined directionality along a local compass heading. While walls do produce some of the HUM tone within a building, windows especially emanate HUM effects with greatest power. The HUM is both heard and felt from windows as a pressured tone. Facing the window of greatest HUM penetration, this strange pressure literally envelopes the body. For this reason many supposed the HUM to be an infrasonic emanation. One may indeed block a great deal of HUM volume by interposing a pillow between oneself and the window of maximum HUM emanation. On doing this with care, one notices a defined and sudden muscular relaxation. Along with this comes a great diminution of HUM volume. But this does not infer that the HUM is an acoustic phenomenon, as recording failures have demonstrated. By what principle is the HUM making its appearance through windows, and by what principle is it possible to block HUM power through organic absorbers?

One especially hears the HUM in the relaxation of sleep. In the silence of night the sense of hearing is able to better isolate specific audible stimuli in the surroundings. The HUM, however, seems to build its presence into an overwhelming suffusion. The loud and suffusive HUM tone, heard with fully opened and unencumbered ears, is an effect responsible for the illusory acoustic nature of the HUM. In this we recognize a characteristic of the ear drum and its ancillary sensitive structures. In addition, observers have noted that the HUM acquires an enriched harmonic "ring" when the ears are

fully opened. These observations do not infer the acoustic nature of the HUM, referring us instead to learn an unsuspected nature of auditory sensation and the auditory apparatus in human physiology.

Opened-ear audition of the HUM acquires harmonic ringing, and often reaches some peak volume, because of forced vibrations. The sense of hearing is overcome by the stimulating energy inherent in the HUM. Auditory physiology is literally driven into a peak resonant condition by the incoming HUM, a phenomenon which demonstrates auto-amplification effects. HUM induction thus actually drives the ear drum and cochlear neurology into a maximum vibrant state, one which often rouses sleepers from the deepest phases of sleep. With the ears fairly suffused with the overwhelming HUM sound, one may perform several simple personal experiments which will clarify the true nature of HUM signals and open a new world of wonder. First, carefully note the nature of the HUM. When you chance to notice its permeating presence, familiarize yourself with its more obvious audible characteristics. The HUM is indeed a "humming" tone. The HUM has a rapid rhythmic aspect, a toning pulsation. In addition to the overall tone and its pulse rhythm, one hears a characteristic aperiodic "fading".

When these personal HUM tests are properly practiced, we may easily count off the rapidly pulsing tones, noting their familiar "asymmetric fades": the sound which has been described as the "distant idling diesel engine". To count the pulses, one first matches their rhythm on fingers. Match the rhythm which you hear. Once you have ascertained the relative correctness of your match, then count off the pulses against a sweep hand dial. Thrumming the rhythm of the counted pulsations against a sweep hand is a simple, but remarkably effective, means for discovering the slow pulsing action characteristic of the HUM phenomenon. One may thus count a steady pulse sequence, finding each HUM event to differ slightly between 6, 7, or 8 vibrations per second. In addition to this overall humming pulsation, a variable "volume envelope" is noted. The humming pulse is one whose strength rises and falls asymmetrically in time. It is this latter feature which some have described as the "idling" hum.

Contrast differences are indeed absent when the test is properly done, care being taken not to distract the HUM focussed attention. Hands must be moved in as much silence as possible. Some analysts object to the need for HUM audio focussing. These critics claim this to be evidence that the HUM is a fictitious sound, the result of mild mass hysteria and self-deception. But since there do exist several proofs that the HUM is an objective reality, we can safely conduct these personal experiments with confidence. During a HUM event, one may sample the differences in HUM amplitude by very gently holding hands over the ears. Most who stop their ears during HUM events actually lose their own audition of the HUM tone through their own rough handling of the test.

One must maintain awareness of the HUM while carefully and silently bringing the hands to each side of the head. One must maintain this awareness throughout the subjective tests, a condition required in such subjective comparisons. Why it is absolutely essential to maintain "HUM awareness" is a revealing phenomenon. First, it is important to recognize the differences in sensitivities across the general population. The HUM is not heard by many people who lack the ability to focus in on environmental stimuli. The HUM is "personally elusive" only because of this demographic artifact. The

HUM is an external and objective reality, having both source directionality and peak time manifestation. When properly conducted, the HUM audio continues being heard with absolutely no amplitude changes. With attention focussed only on the HUM audio, one carefully brings the hands ever close to the ear canals. In this carefully executed personal test, one will indeed continue hearing the HUM even with hands touching. There will be no amplitude change. The only instance in which amplitudes change during the experiment is when we have roughly handled our senses, or created rude distracting noises which overcome our awareness of the HUM.

The HUM tone does not fade when the ears are softly closed. HUM audio is continually heard "within the ears". Thus even with the physical contact closing of the auditory canals, we learn something more about the HUM. Closed ear HUM audition is indeed a clue which leads to our thesis concerning its true nature and source. This remarkable discovery too serves as proof that the HUM is more than an acoustic phenomenon, an anomalous induction which permeates thin single-layer materials and hands. Michael Theroux reported his experiments with the HUM, experiments in which he demonstrated masking effects of the same. Using cloth curtains, it was found possible to block out some of the window penetrating HUM inductions. He also managed to mute the HUM by placing dampening material in window casings. Each of these experiments reveals a strange blend of HUM characteristics, which deserve complete exposition and satisfactory explanation.

The principle value of Victorian Bibliographies finds its utility and advantage when once-familiar anomalous phenomena make their modern reappearance. Lacking modern explanation, one finds the former perspectives of inestimable and timeless value. Too few of the researchers have studied the HUM phenomenon with these perspectives in mind. The degree of depth demanded by this remarkable manifestation of unearthly sound can be found in old and dusty volumes. Now largely forgotten by most of those involved in the work, the "physiophonic effect" is well known by students of early telephonic arts. Physiophony, originally discovered by Antonio Meucci in 1842, involves the electrical transmission of audible vocal signals directly into the neurology of listeners. His accidental discovery is the basis of his first "teletrofono", the first telephonic system seen by the world. In this remarkable physioelectric effect, electrovocal signals breach the resistant skin barrier. Signals are thus "heard within", a physiophonic or "neurophonic" effect which occurs entirely without benefit of the ears.

Physiophonic sound is an externally stimulated internal sound of sometimes enormous volume. With applications of excessive voltages, subjects experience muscular tetanus effects indistinguishable from those observed in HUM phenomenon. The real auditory seat of the HUM disturbance is thus found within the musculature and neurology of its unfortunate sufferers. The "sound" which becomes so deafening at times, is the sound of nerves and muscles. The effect is induced in the musculature of exposed persons, and represents auditory stimulation through myoelectric vibrations. The audible sound is therefore heard in the rapid vibration of muscle tissues which have been externally stimulated by an unknown energy source. The rubbing sound which fills the head cannot be recorded through microphones because it is more powerfully manifested within the very deepest centers of physiology itself. It localizes itself

in the "stomach brain" of the solar plexus, driving the deepest musculature into extreme states of tetanus.

Thus induced by external disturbance, the HUM is actually produced within the contracting muscles. It cannot be recorded with audio microphones. The audio portion of the HUM is the sound of muscles, the strong myocontractions within the neck which stimulate audition. One does not therefore hear the actual source of the HUM disturbance. One hears instead the muscular response to the causative disturbance, that which has yet to be discussed. This physiophonic entrainment is the phenomenon which conspiracists claim are entirely due to military ELF experiments. In addition to this muscle-vibrating condition, one falls into a very deep and distressful autonomic "mood". This deeply emotive condition blocks the normal flow of consciousness, forcing concentration solely on the reestablishment of comfort.

Thus we may understand why the HUM manifestation surges to excessive levels of strength and brings a distinct kind of neuralgia to its more sensitive recipients. The onset of severe muscle contractions, the true cause of sleep loss, brings the primary alarm responsible for sleep termination. The awakened recipient finds his or her entire musculature in a state of unnatural tenor, a painful tension which reduces into a continuous fatigue. With this extreme tenor, sensitive victims "hear the HUM". The painful neuralgic effect is the result of an excessive induction of myocontractions. The exhaustion is reminiscent of results produced by forced-muscle exercise stimulators, designs intended to burn fat through electrical applications to muscle tissue. Neuralgic HUM related conditions grow with time. Without some diminution in the external pain causative agency, individuals become worn down with each nocturnal repetition. The more overt sleep disturbing aspects of the HUM develop with increasing absorption of the nightly effects.

Because these effects are myoelectric frictions, internally induced by external agency, they cannot therefore be recorded through ordinary audio means. But where audio microphone recordings fail, myoelectric recordings should best reveal the HUM in all of its artifacts. The entire body is disturbed by these assaults. The painful "pressure effect" is a muscle response when exposed to the energetic impact. There is every indication that certain individuals retain some lingering portions of the HUM impact for longer periods of time than others. This may have something to do with personal physiochemistry, a variation by which certain neurological systems can self-eradicate the HUM associated toxins. Regardless of the blind instinct to seek shelter and comfort from the irritant, the associated neuralgic pain is never eradicated by relocation alone.

The question, which has addressed this mystifying property asking why so overwhelming a sound fails to produce correspondingly loud magnetic recordings, is thus answered. It is precisely because the HUM itself resists and eludes the best efforts of recording engineers and their equipment, that we innately recognize an entirely different mode of auditory stimulation at work. But what mode? In addition to the weak ground-related HUM sounds, the insomnia, and the neuralgias, there are strange "roaring winds" which sometimes accompany the strongest HUM manifestations. These fill the surrounding limits of the neighborhood, a wind phenomenon unlike any other. One notices that the roaring wind, one which seems to fill the entire local region, seemingly arrives from all directions simultaneously. These roaring winds have a

peculiar vortexian nature. They surround the listener on all distant sides, yet produce no observable movements in any close objects. So great is this roaring sound that one may be awakened by its force alone. Yet, this is not the HUM. The roaring winds appear only during extreme HUM episodes.

It becomes at once apparent that these strange winds are the result of a strange energetic expression, one which is external in source. When the HUM is in its maximum manifestation, one seems to be in the very center of sudden and unexpected weather extremes. These effects fall into the observation center from the outlying periphery shortly after sunrise, a phenomenon of great significance. The wind is very obviously a part of the phenomenon which represents evidence that the HUM is a natural, albeit extreme expression of biodynamic energy. The roaring wind is actually generated by the HUM, a most remarkable part of the HUM phenomenon which takes external physical form. In addition to these winds, one experiences strange acoustic effects which literally suffuse the surroundings.

Distant sounds become abnormally and dramatically amplified during early morning HUM extremes. The sounds of very distant trains become mystifyingly distinct and magnified, seemingly emanating from a few yards away. This strange "acoustic tunneling" effect only accompanies strong HUM events. In addition, the direction from which these acoustic anomalies are sourced exactly matches the compass heading from which the HUM effect arrives in a neighborhood. As if this were not anomalous enough, there is also a distinct kind of lumination all along the periphery of a region. The smokey white light appears throughout the surrounding horizon, a bright white "gloaming" which rises above the treeline. This white light has nothing to do with earth stresses commonly associated with pre-quake or near-quake episodes. It is a phosphorescent expression which has often been observed in Staten Island, a location virtually devoid of the tectonic or piezocrystalline activity usually cited in mechanistic explanations of the phenomenon.

HUM ORTHOGONY

On collating the data received across the nation from several highly revered subject sources, one immediately notices that HUM manifestations vary only with the local experience of sunset: a remarkable coordination from place to place. The HUM effect sweeps through different geopositions with clocklike precision, a phenomenon which would not occur with the deliberate operation of a land-fixed military project. Observers each report nightly HUM effects with time reference made only to their local occurrence of sunset. That the HUM cannot possibly be the result of deliberate military or industrial projects has everything to do with the time coordination and the "attack headings" of each HUM manifestation. Bordering neighborhoods which experience HUM phenomena do not receive the HUM impact from the same compass headings at all. In fact these impact directions, these HUM vectors, often oppose one another.

Study also reveals that some regions, which lie between HUM experiencing lands, do not themselves experience the HUM at all.

We are therefore challenged by perplexing combination of contrary variables: similar local time appearances, completely differing compass headings, identical pulsation envelopes. But the geographic "sweeping" time effect is the strongest evidence that

HUM phenomena result from more fundamental natural processes. Smooth procession lines may be mapped across the nation for each specific event. On any particular night of HUM activity, one observes that HUM effects appear after local sundown. Widely separated persons who felt the HUM effects did not feel them at the same hour, relative to any possible source point. In fact, HUM effect sites revealed a time reference with respect to local sunset alone. This remarkable fact alone indicates that HUM phenomena are natural phenomena, and not military projects at work.

There are places where the HUM vectors, directions from which the HUM is actually impacting a region, completely differ from one another. In this aspect, one of enormous import, the georegional HUM orthogony is completely asymmetric. Thus we see how HUM vectors do not occur along strictly identical compass headings. One may not draw a smooth line through towns and cities and find consistency in the HUM vectors. Were the HUM a military signal, we would expect it to make itself known across the nation on a singular registered instant of time. But the HUM does not reveal any such panregional orthogony. Despite the consistency of each regional report, no consistency in the time of the local events can be cited. Indeed, no singularity in the observation of the "HUM" exists across the nation or world.

Were military ELF systems the responsible parties, one would expect every HUM observation to occur at a single fixed time, regardless of geographic position. Each nightly HUM event would therefore occur with reference to the station source, a singular time coordination which would be recognized by observers across North America. HUM effects would be expected to vary by a fixed 3 hour interval across the nation, even if deliberately varied by the "source station". The conspiratist model presupposes this "national sweep" to be a deliberate deception, the phantom military stations nightly sweeping the United States to hide their presence. Indeed, the HUM seems to represent a source whose throbbing signals contain some mysterious conscious message. Many who have experienced the HUM mention a mysterious awareness that the throbbing HUM is "under conscious control". Indeed, it is under conscious control...but not by human agency. I have no longer any doubt that the HUM is an intensified expression of the prolific natural energy, that agency responsible for organizing and bioarticulating the natural chaos.

AEOLUS

In its audio characteristics, the HUM is not a new phenomenon. Having attributes tantalizingly identical with modern observations, the HUM has given its persistent performance throughout history. The HUM was known as "Aeolian Wind" in its ancient expressions, an identical low pitched throbbing tone which "moaned" in the dark of night. The occurrence of HUM phenomena were reported in various popular journals throughout the Nineteenth Century, undoubtedly attempts to solicit scientific perspectives on the effect. A sound known as the "wind in the mountains" was reported in 1928. Long a part of local folklore in Seskin, Ireland, this "variable throbbing tone" resembled that produced by a "distant engine". British observers of the same phenomenon stand on record since the last World War, when residents of London and Southampton reported the same throbbing HUM in 1940.

The HUM and its more auditory attributes have a lengthy historical record. The HUM predates symbols of modern conspiratist

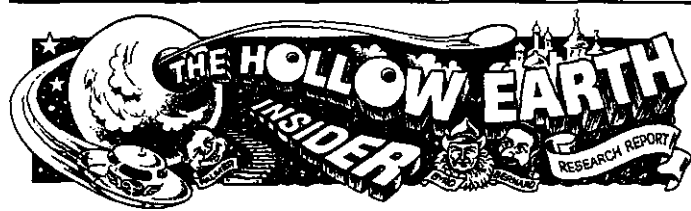
mythology, such as SANGUINE and HAARP, by centuries! Added to the aforementioned empirical evidence, one marvels at the adamant attitude of those who adhere to symbolic models which deny the obvious. Facts which deny "military culpability" may irritatingly deflate the theme of symbolists without doubt. I both thoroughly expect and encourage a wonderful flood of critics who cannot pull themselves away from the turbidity of symbols and myths long enough to breathe in the new view of a conscious atmosphere. Please write, I adore your symbolologies.

Regardless, one must rest secure in the revelation of a viable and more personally relevant world foundation than symbolists can ever hope to develop. In order to obtain a measure of comfort, albeit a perverse and deranged expression, some require their hairshirt of fear. If your need for fear is indeed your security, I will give you a better hairshirt than the best fear merchant can weave. There is an implicit warning in what I have written, one which should resound throughout the community. Symbolism and its seductive threats can only incapacitate those who fall under its fascinating vacuous sway. Hopefully, some will be shaken away from the muddy security of their subconscious rivers long enough to see the light of day...while it lasts. The new attributes of the HUM greatly concern me, being a manifestation of bioaction on a greatly magnified level. Neither in former centuries nor decades had the natural HUM phenomenon manifested its irritating incursions. The new pain-generating effect is evidence that a panregional revulsion is taking place, one in which biodynamic energy is now consistently making incisive forays against the deranged by-products of a now too gauche and overdone mechanistic technology.

Caught in this titanic crossfire, humanity is only beginning to feel the first deadly embrace of a world-condition which may prove to be terrible in consequence. The HUM is the first evidence of this struggle. Indeed, we are witness to dynamic energies whose essential characteristic is biological and conscious in nature. For those truly devoted to the possibility of developing a bioenergized and geoconscious technology, these findings could not have arrived at a more opportune moment in history. Nevertheless, if the HUM phenomenon is not studied and comprehended from a more scientific base, then counter-measures will not develop in aid of humanity. □

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EXPERIMENT: THE CAMERON CONES AND "VRIL STICK"

BY VERNE CAMERON

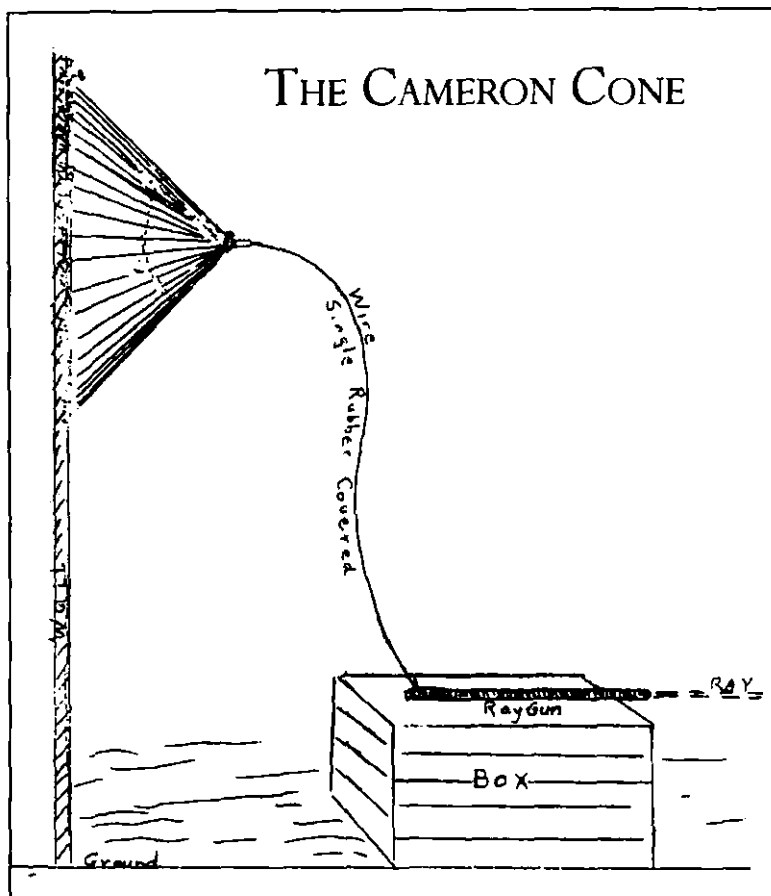
Reprinted from *The Pyramid Guide*

THE Cameron Cones are a momentous discovery since they have the unique and amazing faculty of accumulating from the ether a strange new force or wavelength of energy which is very closely related to not only the energy surrounding the human body, but to the strange force attached to the Great Pyramid of Giza, which is undoubtedly God's Holy Ark or Sign, as well as to the rays of energy reflected from underground water. All these rays and forces are able to supplement or amplify each other, or in some cases counteract each other. The Cameron Cones are the result of many years of experimentation in laboratory and field in the quest for the origin and nature of the rays, of the nature of light, which emanate or reflect from underground streams of water. The energy I have found in a series of tests extending over years comes in either from outer space or it saturates the ether which surrounds and penetrates everything, and it is attracted to the cone where it glides along the outer surface and is thrown off from the apex or vortex of the cone in a ray or beam which, if not confined, will travel from the cone in a gradually increasing column to a distance, in the case of 22-inch aluminum cone, of about one-half mile to where it comes to an abrupt end 300 ft. in diameter, for all the world like the beam of a search light striking a cloud. This energy has much the character of electricity, and actually is a form of electricity, but also follows many of the laws of light, seeming to bridge the gap between the two. It therefore seems certain that it has an exceedingly short wave length, and this I have determined lies in the wave spectrum between the upper end of the cosmic ray spectrum, which embraces all the rays from the Alpha, which are 1/4,000,000th of a millimeter in wave length, and the Ultra-violet just below visible light, and I am fairly certain it is in the gap of unknown rays just above X-ray, of which there are many variations. At the top of this spectrum lies alternating current, with a wavelength of 400,000,000 millimeters.

When hung on a wall or post, a conical beam is projected, as I have said, which, with a 22-inch cone, is 10 inches in diameter at the start, and years ago I became convinced that if I could confine this beam to prevent its flaring, since it seemed to be meeting resistance in the ether, which pervades all space, into a concentrated high pressure beam, it might travel to an almost unlimited distance. After months of laboratory experimentation, I found that it could be conducted through any kind of wire, no matter how small, because of its terrific voltage, and if caused to follow a right hand spiral (like the threads on a wood screw) around a glass tube a couple of feet long, with a wire spacing of about 1/4 inch, it would induce an electro-magnetic force in an iron tube inside the glass tube, and this would eject a powerful beam many miles long from the forward end

of the tube, that is, if the wire were attached to the rear end of the spiral, but if wound anti-clockwise, the cone ray would be projected to the attached end of the tube, this showing a distinct polarity and the nature of direct current rather than an alternating current. This may be tested with a pendulum (a small weight on the end of an 8 inch thread) which, when held near the beam, will spin in a circle which will flatten on one side or change into an oval or a back and forth oscillation in line with the force beam. There are many other methods of locating and testing this force, but all are only crude makeshifts when compared to the famous Cameron Aurameter, which is so much more sensitive, yet so much less affected by the subconscious mind, as in wishful thinking or autosuggestion.

The cone must be an exact right angle so that the apex will, when placed in a carpenter's square, go into the corner of the square, with the sides of the cone fitting close to the inside of the square. This angle is critical. For approximately a 22 inch cone, have a tinsmith cut a disc 30 inches in diameter from thin aluminum — 28 gauge is fine — and slit it to center. Then, curl it close at center and less and less as you approach the outer edge (it is better to do this in a machine to get a smooth curve, though it can be hand bent over a piece of pipe extending from a vise about 12 inches, allowing 1/2 inch or so for lap). Cut away the excess, which will measure, I believe, about 24 inches around the edge. Now spot-weld or rivet the lap, making sure the cone is uniformly bent, then roll 1/4 inch of the edge out until it makes a flat rim. Next, drill and flatten the apex slightly to receive the female part of an electrical plug-in, such as a banana type which may be obtained at an electronics shop. The male part of the plug-in can be attached to any flexible insulated wire, such as 1/2 of an ordinary rubber drop cord, which splits easily and is very flexible. Be sure the receptacle is firmly locked in, as it will be next to impossible to replace it if it comes out. Now cut another disc 1/2 inch or so larger than the base of the cone, roll the edge to a right angle, after which it may be bent or rolled over the edge of the cone, making a strong, firm enclosed base. A hole may be drilled or punched in the edge of the cone so it may be hung on a nail to suspend it 5 or 6 feet above the ground or floor, where it seems to function best. The cones may be made of cardboard and covered with aluminum foil, and seem to work just as well, but I much prefer metal cones, and aluminum, because of its lightness, is much preferable. The opposite end of the lead-off wire may be attached to a copper kitchen scouring pad for testing the ray's effect on the body, or to the ray gun for projection experiments. The cone may be used without the wire to test the effect on underground streams, etc. Many researchers, all over the world, are carrying on experi-



ments with the cones, and requests are continually coming in for more information about them. There is a vast field of discovery awaiting researchers here. My writer friend, Gaston Burrige and friend Ely Carse, confirmed many of my experiments in independent research. Illustrations on this page show construction details.

THE FREE ENERGY DISCHARGE TUBE (The CAMERON RAY GUN or "VRIL STICK")

INFORMATION AND SUGGESTED EXPERIMENTS

When the tube-copper wire connection is made to the apex of a pyramid or cone of metal construction, the following results have been obtained by Mr. Verne L. Cameron and others in experiments:

The rays projected through the tube apparently do not go through glass and other reflecting surfaces. When the tube is focused against a mirror perpendicularly, Mr. Cameron found the beam reflected back into the cone, slowly building up a charge in it with a measurable force-field bulging out farther and farther around it until it assumed the form of an enlarged energy field occurring both around the cone and the glass or mirror.

When the ray is intercepted by glass, it mo-

mentarily vanishes for about five seconds; but when the glass is removed, the ray reestablishes itself within another five seconds.

Cone rays show the characteristics of ultra-violet light, infra-red, and X-rays in their abilities to pass through material substances.

The cones or pyramids can be connected in series from base to apex, etc., to increase the power flowing through the tube.

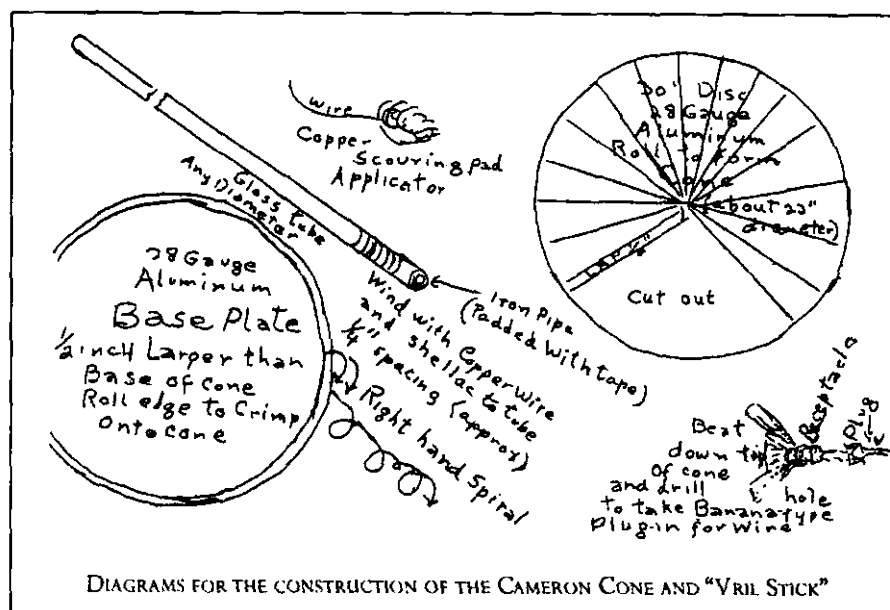
Cameron and Carl Betz hooked up a 25" aluminum pyramid by copper wire from apex to ray gun and found with dowsing devices that the beam was measurable over one-half mile distant.

Cameron mounted a 22" cone about 5' up with the base against the side of his garage door. The apex pointed out towards the then-dry bottom of Lake Elsinore. He then followed the beam by driving his car, periodically checking the beam with his dowsing device. About a half-mile out he was surprised to find the beam suddenly terminating where the rays had flared to an estimated 300' diameter, behaving in the manner of a searchlight striking a cloud. This beam, when concentrated through the tube, will, according to Cameron, maintain its original diameter in a laser beam effect when also connected to a pyramid's apex.

Mr. Cameron found a curtain of force projecting below a pyramid-energized tube ray projecting out a distance 936'. His dowsing instrument bent away as though striking an invisible wall. In another experiment, Cameron stated he was able to project a cone ray some

4 miles across the lake bottom and striking the side of a building with undiminished force.

Pyramids and cones must be of metal construction to function with the tube, according to Mr. Cameron. Keep pyramid base down. Cones work either base down or against a wall, he states. The tube has been used in hand-levitation and radio experiments. □



THE WEATHER WORKS OF TREVOR JAMES CONSTABLE

LOOM OF THE FUTURE

The Weather Engineering Work
of Trevor James Constable

An Interview Conducted by
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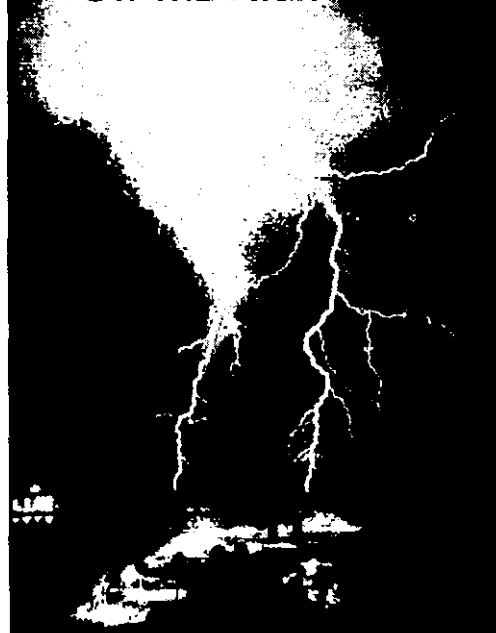
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ETHERIC WEATHER ENGINEERING ON THE HIGH



Trevor James Constable

DETECTING BIODYNAMIC SIGNALS

PART II

REMOTE BIOLOGICAL SENSING



by Michael Theroux

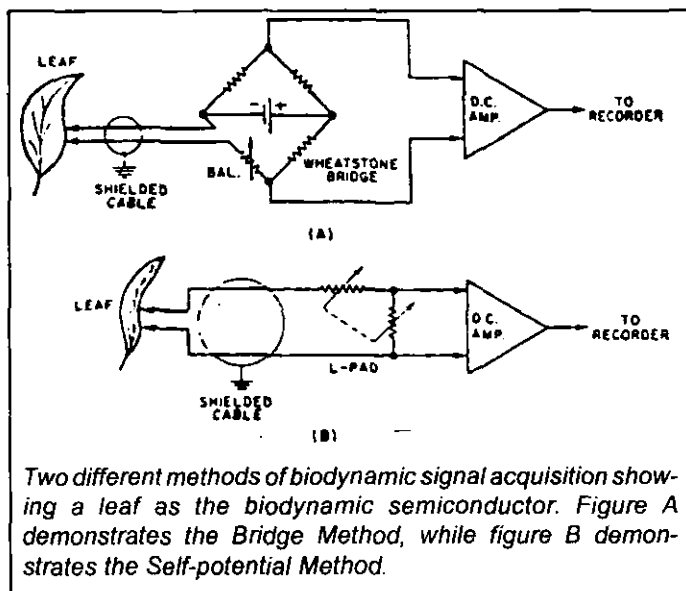
IN the last issue of this magazine, we covered some of the basic methods concerning the detection of biodynamic signals of a biodynamic character. A brief history of the work of L. George Lawrence was examined along with some practical applications of biodynamic signal detection. Since the writing of part one in this series, new and exciting information in regard to the present work and the works of L. George Lawrence has been discovered. BSRF has recently acquired patent documents, equipment, and an unpublished manuscript entitled, *Galactic Life Unveiled - The Phenomenon of Biological Communication Between Advanced Life in Space and Its Subliminal Effects on Terrestrial Man*, by L. George Lawrence. Examination of these materials uncovered many startling facts about the real work of Dr. Lawrence, and confirmed many assumptions we had based on our own empirical findings. *Galactic Life Unveiled* is a complete thesis by Dr. Lawrence based on 17 years of remote biological sensing (RBS) field studies and interstellar communications. We are currently in the process of publishing this rare book which should be available by spring of 1997.

Methods of Biodynamic Signal Translation

The plant response detector or signal processing translator detailed in part one represents only a fraction of the equipment used in the disclosure of biodynamic signals. Dr. Lawrence utilized a system which included a telescope for sighting, a biodetector assembly containing biological transducers, electronic signal conversion equipment, EM artifact detection equipment, and a video attachment for the production of biograms. In the eighty page patent document entitled "Methods and Receiver for Biological Data Transport", Dr. Lawrence sites five different methods of signal processing translators as follows:

1) **Bridge Method** - Biological semiconductors exhibiting electrical resistance changes due to external signal impingement may be arranged in a classic Wheatstone bridge arrangement (see schematic in previous issue).

2) **Capacitance Method** - Biological semiconductors expressing variations of capacitance during stimulus events may be embodied to function as a frequency-control element in an oscillator of the FM type. Read-out may then be secured by means of a frequency counter or equally suited device. High



impedance or optical devices are used to sense given piezoelectric phenomena accompanying capacitive reactions.

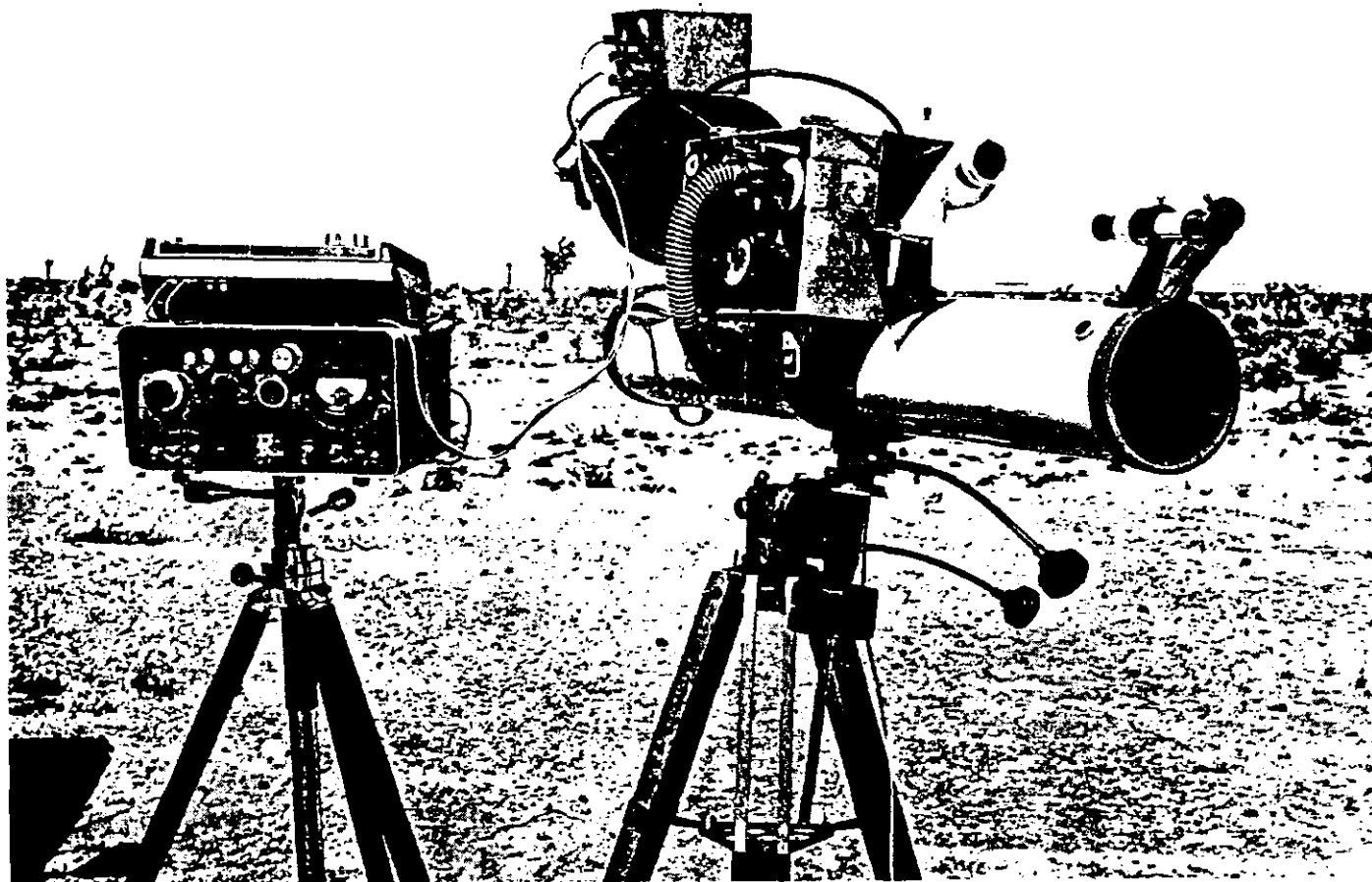
3) **Electrostatic Method** - Biological semiconductors

which are electrostatically active (active charge acquisition and depletion) as a result of local excitation and the presence of external biodynamic signal events may be read out by means of a charge-coupled device (CCD) or on photographic film.

4) **Optical Method** - Biological semiconductors evidencing optical properties of a primary (luminescence) or secondary (transparency alterations) type during signal incidence may be read out by means of photoelectric devices and Bragg cells.

5) **Self-Potential Method** - Biological semiconductors expressing changes in electrical self-potentials due to signal incidence, may be amplified by non-loading high impedance devices such as electrometers.

As we can see, there are a variety of means by which we may obtain and translate signals of a biodynamic character in biological semiconductors. It must be remembered, however, that biological materials exhibit characteristic actions of their own due to normal living cell function. It is the sensitization or excitation duty either as a service of the processing method or induced separately which will suspend these functions to secure diagnostic control over natural and inter-communicatively in-



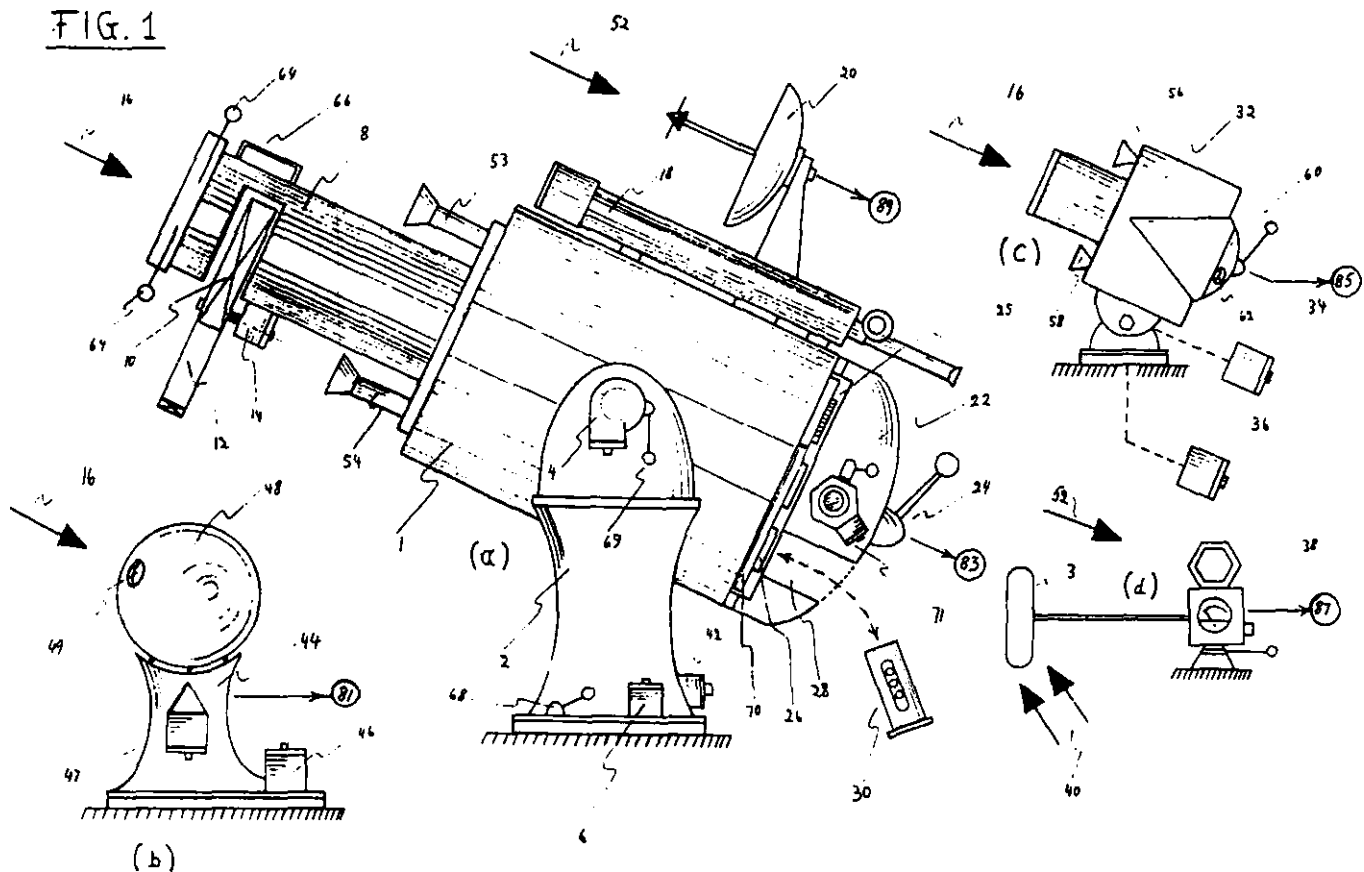
Above: Biodynamic field station developed by L. George Lawrence. Designed for the detection of intelligent biodynamic signal modulations of galactic origin first accidentally discovered during ecological remote sensing research in 1971.

duced responses of living cells. In our experiments, methods 1, 2, and 5, offer the most continuously successful procedure of biodynamic signal procurement, and are also the most cost effective. The repeated success of this instrumentation may be primarily due to the combinative sensitizing/receiving nature of the acquiring method.

Image Acquisition and Biograms

Early on in the RBS experiments, Dr. Lawrence developed a means by which biodynamic signals could be translated into video images. Although he spoke of using CCD technology as an ideal, he favored the most basic biological data display technique of using facsimile recording. This system simply injects the electrical signals produced by the biological semiconductors into a type of AM modulator. This modulates a given frequency band in such a manner so that varying amplitudes are a precise reflection of the modulating direct current product which can then be rendered into facsimile images. In our experiments, we have utilized the same protocols with greater flexibility regarding image resolution and acquisition.

In the system we are currently using, the signal processing translator's modulated biodynamic signal output is fed directly into a PC via a Digital Signal Processing (DSP) interface (first tests were conducted on an old 80386 but for portability and speed, a Pentium 100 laptop is used). Special software is used to provide the images on the screen which can be saved and later printed out. The Biograms we are generating begin with a complex of individual frequency components and harmonics of the modulated biodynamic audio output, which covers a wide frequency range and varies in intensity over time. The software simply plots the frequency content of the biodynamic signal as a function of time with harmonic intensity represented by a variable color scale. The software uses a mathematical Fast Fourier Transform (FFT) in performing the frequency analysis. FFTs are usually specified by the number of input data points used in each calculation. For a sampling rate of F (cps), an N input point FFT will produce a frequency analysis over a frequency range of $F/2$. Signal amplitude will be calculated at $N/2$ frequency increments in this range. The software provides both narrowband and broadband processing options. Narrowband processing



12-19-81 L.G.L.

Figure 1 from the eighty page patent document entitled "Methods and Receiver for Biological Data Transport" by L. George Lawrence. The instrumentation diagram on the following page details the components of the the complete field apparatus.

produces a display of high frequency resolution which resolves the individual harmonics of the audio sample. Broadband processing broadens the frequency response of the FFT and produces a display which smoothes over the individual harmonics to show broad areas of intensity. To simplify, the software package samples the input, performs an FFT, and graphs the output in the form of a 3D time-frequency plot or spectrogram, where one axis is time, the second is frequency, and the vertical axis is the signal level at the specific time and frequency. Biograms are finally extracted from the complex modulated portions of the emergent spectrographic image. Then very small sections of the image – little more than a few microseconds in duration – are enlarged to an appropriate viewing magnification. These completed Biograms can later be rendered into video presentations in a frame-by-frame sequence. While this system is probably not the ultimate in Biogram acquisition (mainly due to its dependence on the linear time constraints of the received signals), it presents specific imaging of the perceived biodynamic modulations and *allows eidetic content to appear within*. One of the major advantages of this system is that the AM modulated biodynamic signals can be recorded and stored on analog or digital media to be later played back for image processing.

The most difficult task for the researcher lies not in the equipment setup, but in the interpretation of the acquired images. Some images will reveal distinct impressions which need little translation, but many seem fragmented and are probably simple frames in an evolving complex perpetuity. One may discern a likeness of these images to those obtained by Dr. Ruth Drown in the use of her Radiovision instrument, the De laWarr camera pictures, or the eidetic emulsions of Gerry Vassilatos. It was Dr. Lawrence's goal to secure biodynamic signal images without the need for a time dependent scanning process – to procure complete frames instantly – much like the older systems of Drown and De laWarr. Since we know the character of biodynamic information is strictly of an *eidetic* nature (meaning

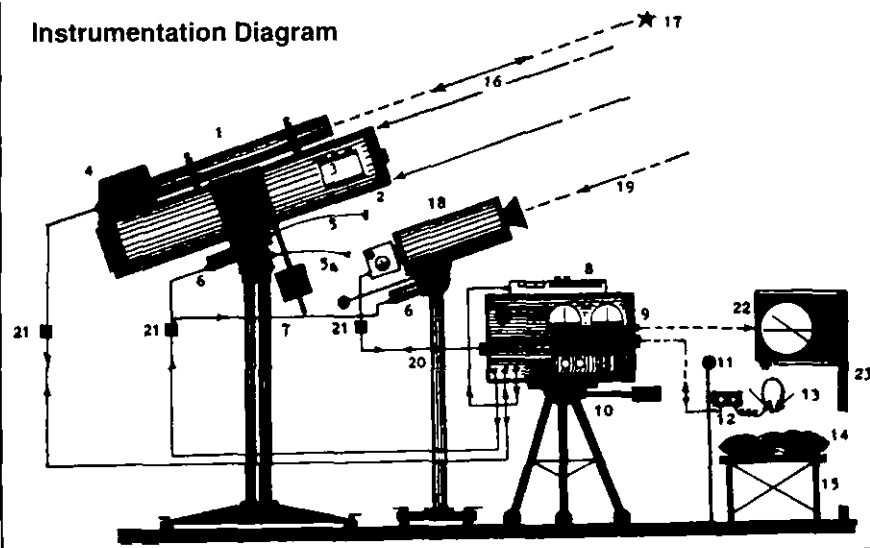
GALACTIC LIFE UNVEILED



L. GEORGE LAWRENCE

Above: *Galactic Life Unvelled - The Phenomenon of Biological Communication Between Advanced Life in Space and Its Subliminal Effects on Terrestrial Man*, by L. George Lawrence. A complete thesis by Dr. Lawrence based on 17 years of remote biological sensing (RBS) field studies and interstellar communications. Borderland Sciences is currently in the process of publishing this rare book which should be available by spring of 1997.

Instrumentation Diagram



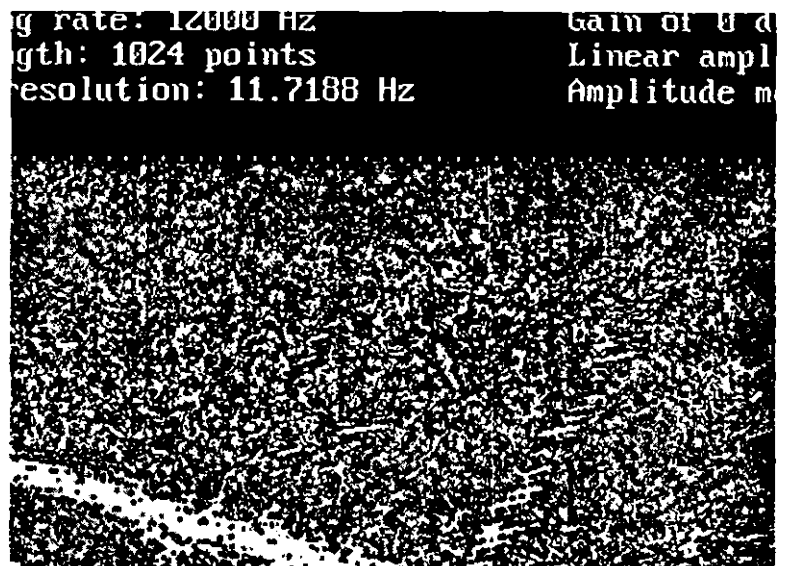
Left: Diagram of Biodynamic Field Station. Principal components are: (1) Faraday Tube, (2) Newtonian Telescope, (3) Camera, (4) Transducer Chamber, (5) 5A Slow Motion Controls, (6) Ascension Drive, (7) Mounting, (8) Field Recorder, (9) Electronics, (10) Tripod, (11) Ground Spike, (12) Remote Controls, (13) Headphones, (14) Headrest with pillow, (15) Observer's Night Cot, (16) Optical and Biodynamic Target Axes, (17) Celestial Object/Domain, (18) Electromagnetic Interference Monitor, (19) RF Incidence, (20) Mounting, (21) Connectors, (22) Synchronous Star Map with Illuminator, (23) Mounting.

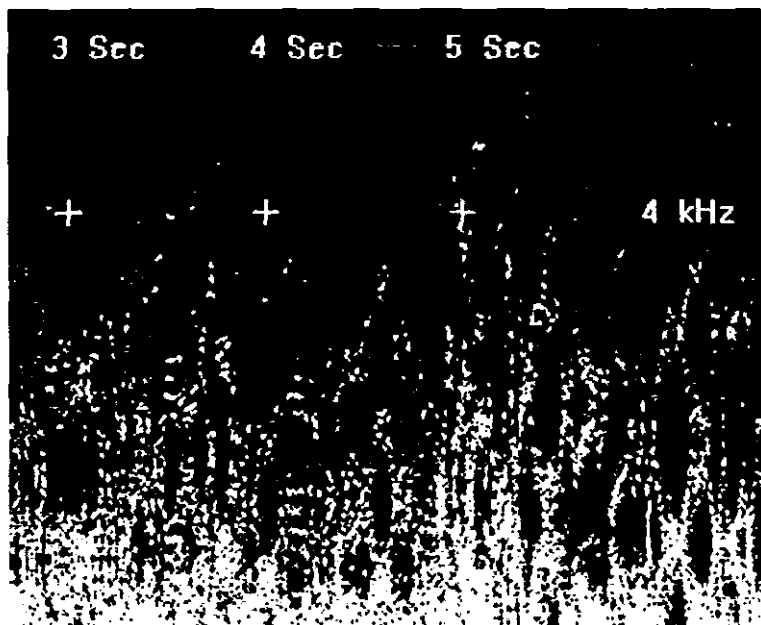
A GALLERY OF BIOGRAMS



Left: These two biograms on the left were obtained by L. George Lawrence using the biological data display technique of facsimile recording. This system simply injects the electrical signals produced by the biodynamic semiconductors into an AM modulator. This modulates a given frequency band in such a manner so that varying amplitudes are a precise reflection of the modulating direct current product which can then be rendered into facsimile images.

Below: These biograms were some of the first recorded at BSRF using spectrographic software designed for use in bioacoustics. The Biograms were generated beginning with a complex of individual frequency components and harmonics of the modulated biodynamic audio output, which covers a wide frequency range, and varies in intensity over time. One of the major advantages of this system is that the biodynamic signals can be recorded and stored on analog or digital media to be later played back for image processing.





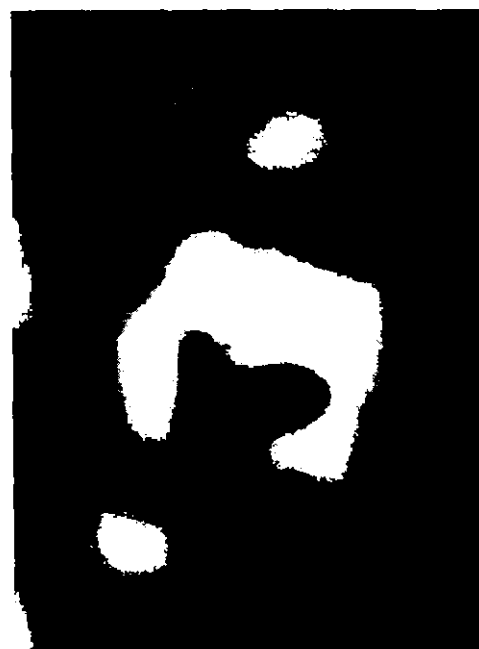
Above left and right: Initial stages of simple Biogram acquisition. Biograms are extracted from the complex modulated portions of the emergent spectrographic image. From these, biodynamic substrate modulations can be singled out and enlarged.

Left: Image extracted from complex Biogram (magnification 4X).

Bottom left: Image extracted from complex Biogram (magnification 4X).

Bottom right: Image extracted from complex Biogram (magnification 16X).

While this system is probably not the ultimate in Biogram acquisition (mainly due to its dependence on the linear time constraints of the received signals), it presents specific imaging of the perceived biodynamic modulations and allows for eidetic content to appear within.





***Above and below:** Dr. Lawrence conducted his field experiments with the goal of obtaining signals from living systems such as the Joshua trees shown in these photos. He would simply inject a premeasured amount of DC electricity into the tree by remote control while training the sights of his field equipment containing the biological transducers directly on the subject tree. As the tree began to respond to the current, the biological transducers would simultaneously react to the irritation experienced by the tree. Increasing the distance from the subject (up to several miles) proved no obstacle to the reception of signals with no decrease in signal intensity.*

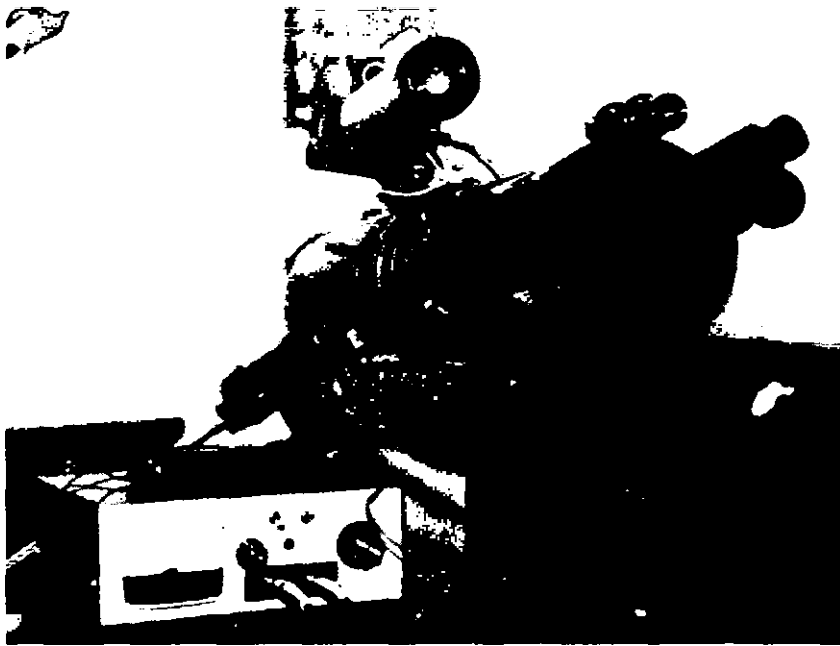
that its reception is in the form of whole images), and it propagates in a longitudinal (time independent) fashion, the prior systems of instant frame acquisition would be ideal. Charge-coupled device (CCD) technology while promising, is expensive and provides a somewhat distorted biodynamic image resolution. Photographic film techniques, while procuring the highest resolution images, are time consuming and relatively unmanageable in most field situations. Work is currently in progress to modify and develop similar systems in conjunction with present technology.

Remote Biological Sensing and Radionics

Wading through much of the technical data concerning biodynamic signal acquisition, one may lose sight of the real importance of this exciting borderland technology. This is the science of receiving living biodynamic information at a distance. Of course, we already have an example of such a technology in radionics, a qualitative science which not only possesses the ability to receive living energy, but may also transmit living energy over great distances. With the remote biological sensing system, we have no similar means of tuning or transmitting as in radionic systems, but it does possess the ability to receive

patterned living information which through its electronic interface presents us with an added quantitative element to the qualitative study, and may be used in conjunction with radionic systems. It offers another means of verification in biodynamic information analysis, and can be used in connection with the more subjective use of pendulums and stick plates. Researchers working in the field of Radionics have long sought an agency of "automated detection" of radionic energy which could be directly incorporated into their instruments, and several such examples exist today. The treatment instruments of Ruth Drown, for example, included a small microammeter which would give indications when a patient was connected to the instrument via the footplates and probe. A later example would be the "RAU-2" radionics instrument of J. Gallimore. This system dispensed with the stick plate altogether, and utilized a very sensitive GSR (galvanic skin resistance) circuit with microammeter which would, when connected to the operator, give specific indications while tuning. The RAU-2 was designed for use in agricultural work where a human operator would determine, via the response indications of the GSR, specific radionic patterns while tuning the instrument. In recent experi-





Biodynamic Field Station developed for Remote Biological Sensing. This system, built by the author, has been condensed into a smaller package due to technological advances in the miniaturization of specific components since Dr. Lawrence's day. The telescope, a 4.5 inch reflector with equatorial mount and motor drive, is standard, and is identical to the one used by Dr. Lawrence.

ments (see "The Borderland Experimenter", 3rd Qtr, *Borderlands*) such a system has been used successfully while replacing the human operator with a plant, allowing the plant to determine individual radionic "rates". Many modern instruments are now including such automated detection devices in their construction.

The applications of a remote biological sensing system are not strictly limited to living energy verification experiments. Dr. Lawrence accidentally discovered that living biodynamic signals could be received from particular locations in space, and implied that we may be constantly receiving directions or instructions of an eidetic nature from an intelligent source outside our own solar system. These experiments of Dr. Lawrence, and our own, will be detailed in upcoming issues of *Borderlands*.

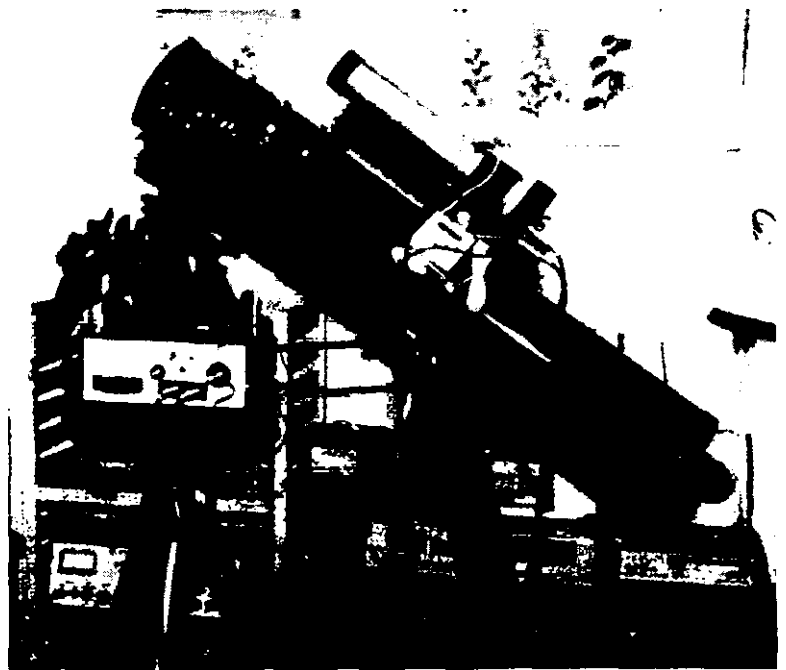
Field Tests and Biodynamic Signal Acquisition

L. George Lawrence spent much of his time in isolated desert locations performing remote biological sensing operations. Many parts of the desert are free from electromagnetic interference which can complicate biodynamic signal interpretation, so it is an ideal place to perform experiments in remote biological sensing. As we have already discussed, Dr. Lawrence's system incorporated many instruments in his field opera-

tion system. This system is best observed in the patent figure and instrumentation diagram accompanying this article.

A typical field operational setup for remote biological sensing includes the following: An astronomical telescope, a Faraday chamber that contains the biological transducer complex, a rotating shutter for "chopping" incident electromagnetic interference for easier detection, a temperature controller, a regulated power supply, a local oscillator to permit an AC-rendering (for AC recording) of the data envelope modulated by a DC amplifier, and final recording of data by a field recorder. A processing amplifier and meter provide primary, unmodulated monitoring of the incoming signals.

Initially, Dr. Lawrence conducted his field experiments with the goal of obtaining signals from living systems such as the Joshua trees shown in the photos. He would simply inject a premeasured amount of DC electricity into the tree by remote control while training the sights of his field equipment containing the biological transducers directly on the subject tree. As the tree began to respond to the current, the biological transducers would simultaneously react to the



Seen here, in the lab at BSRF Headquarters, is the Biodynamic Field Station constructed by the author. The design is very similar to Dr. Lawrence's with a few minor modifications. The Faraday chamber (the tube on top of the telescope) has been reduced in size, and incorporates specific geometric proportions for optimum Biodynamic signal procurement.

irritation experienced by the tree. Increasing the distance from the subject (up to several miles) proved no obstacle to the reception of signals with no decrease in signal intensity. With these many inaugural tests, Dr. Lawrence was able to perfect his system of the reception of biodynamic signals.

The RBS field equipment in current use at BSRF (see photos) is nearly identical to Dr. Lawrence's with a few minor adaptations and modifications. In comparing the photos, one can see that our system has been condensed into a smaller package, and this is mainly due to technological advances in the miniaturization of specific components since Dr. Lawrence's day. The telescope, a 4.5 inch reflector with equatorial mount and motor drive, is standard and is identical to the one used by Dr. Lawrence. The Faraday chamber has been reduced in size, and incorporates specific geometric proportions for optimum Biodynamic signal procurement. The system is "shutterless" as incident electromagnetic interference is easily detected within the biomass cavity by a highly sensitive EM probe. Temperature control and monitoring is also done from within the biomass cavity. All electronics for monitoring incoming signals are housed in a single unit, and the field recorder is of the microcassette type. A countdown timer is used to indicate time elapsed, and to signal the end of the tape. In addition to the standard equipment, a laptop portable computer is used to continually render images of the modulated biodynamic signals for visual monitoring while in the field. Ancillary equipment may include star chart software, magnetometers for monitoring geomagnetic disturbances, and various other electronic devices used for detecting EM artifact.

Early lab tests with this system are quite promising, and several field trials are scheduled for the upcoming year. In Part III of this series, we will describe the many species of biological transducers, present an interpretation of the eidetic content in biodynamic signal acquisition, and cover the problem of interstellar communications complete with galactic sources. For those interested in essential and related information on our topic, references, patent sources, and an extensive bibliography of the works of L. George Lawrence are included here. □

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THE SONIC DOOM OF VLADIMIR GAVREAU

by Gerry Vassilatos

HE listened and closed his eyes as the rolling waves of sound poured over and through his being. Thrilling, intoxicating, the hysteria of heaven, the enthralled and frightening flight of angels. Electrifying. Messaien's organ music signalled messages of meaning, titanic foghorns ululating among dimly perceived near-worlds. Olivier Messaien, master composer of musical expressionism, used the ground thrumming tones of great Parisian cathedral organs to evoke sensations which may only be called otherworldly. Masterfully macabre. Black foundations, blue pillars, and rainbow ceilings.

Sound, rhythm, and space. Ultra-chromatic chord frames, rising like rock walls from the black depths. And immense stellar crystallizations, radiating tonal perfumes through deep and black radiant space. Lovely and lyrically swooping melodies, the flight of birds through delicate limbs. And melodic lines, reaching up toward unknown depths of space, each had their foundation in ultrabass tones of rooted depth. The basso profunda of Messaien are the critical foundations, the strong vertical pillars of an immense architecture which extends beyond performance walls. He scoured the deep and unreachable roots of worlds to hold his musical cathedrals together. Such majesty and grandeur of sound! Rich in the intelligence which flooded and made the world, the musical currents and the atmosphere of tones. Fluidic music and meaning.

The most fundamental signals which permeate this world are inaudible. They not only surpass our hearing, but they undergird our being. Natural infrasounds rumble through experience daily. There, manifestations are fortunately infrequent and incoherent. Infrasound is inaudible to human hearing, being of pitch below 15 cycles per second. The bottom human limit. The plinth. The foundation. Infrasound is not heard, it is felt. Infrasound holds a terrible secret in its silent roar.

Infrasound produces varied physiological sensations which begin as vague "irritations". At certain pitch, infrasound produces physical pressure. At specific low intensity, fear and disorientation. Nazi propaganda engineers methodically used infrasound to stir up the hostilities of crowds who were gathered to hear their madman. The results are historical nightmares.

At a very specific pitch, infrasound explodes matter. At others, infrasound incapacitates and kills. Organisms rupture in its blast. Sea creatures use this power to stun and kill prey.

The swelling bass tones of the cathedral seem as though they can burst the very pillars which uphold the ancient vaults. Stained glass windows have been known to erupt in a shower of colored fragments from the organ's basso profunda. Impulsed ultrabass tones...thunder.

Somewhere in the almost inaudible roll of these basement sounds there was a devastating and fearful power.

THE ABYSS

The Cold War was on. The United States alone held the dread secret. The most terrible weapon yet developed was the private property of one government. The mere existence of the atomic bomb was a threat to nations whose motives were not entirely altruistic. Motivated, aggressive, and imperialistic, obtaining atomic bomb data was a priority for several nations. The only manner in which some nations obtained the secret was by stealing it. When Stalin's science officers finally developed an atomic duplicate of the American bomb, pressure suddenly was placed upon every other European nation to achieve an equivalent or better device.

When one seeks to defend one's borders, the consequences of releasing weapons of devastation to the world do not seem important. Weaponry is death-oriented by nature. But there are moral differences between weapons of defense and weapons of offense. Previous to this atomic proliferation, competing nations concentrated their weapons research on truly bizarre and equally deadly means for defending their national boundaries. A great variety of such deadly weapons were perfected in rapid succession. This included deadly variations and combinations of gas weaponry, pathogenic agents, and radiant weaponry. Stalin's research teams investigated psychic powers as a possible means for destroying an enemy. Psychotronic warfare was developed among numerous groups, both private and national, with measurable success. Information on some simpler psychotronic weapons have recently been obtained through an increasing process of Soviet disclosure.

In truth, the larger the weaponry the less safe the national boundaries truly were. While the superpowers concentrated their weapons development programs on mass-destructive nuclear weaponry, others focussed on more practical conventions. The limited tactical warfare of small battlefields seemed a more immediate need. While developing their own atomic device, France sought defensive tactical weaponry on every possible technological front. Short range weapons would best defend against a conventional national assault. But other systems were also sought; systems which, though non-nuclear, were equally invincible. As the great Frankish Knight, Charles "the Hammer" Martel repelled ruthless invaders from the medieval east, so a new hammer would be sought to defend France against possible new enemies from the east. Even as Charles Martel arose from obscurity, so this strange new "hammer" would arise in equal obscurity.

GAVREAU

The central research theme of Dr. Vladimir Gavreau was the development of remote controlled automatons and robotic devices. To this end he assembled a group of scientists in 1957. The group, including Marcel Miane, Henri Saul, and Raymond Comdat, successfully developed a great variety of robotic devices for industrial and military purposes. In the course of developing mobile robots for use in battlefields and industrial fields, Dr. Gavreau and his staff made a strange and astounding observation which, not only interrupted their work, but became their major research theme.

Housed in a large concrete building, the entire group periodically experienced a disconcerting nausea which flooded the research facility. Day after day, for weeks at a time, the symptoms plagued the researchers. Called to inspect the situation, industrial examiners also fell victim to the malady. It was thought that the condition was caused by pathogens, a "building sickness". No such agencies were ever biologically detected. Yet the condition prevailed. Research schedules now seriously interrupted, a complete examination of the building was called.

The researchers noticed that the mysterious nauseations ceased when certain laboratory windows were blocked. It was then assumed that "chemical gas emissions" of some kind were responsible for the malady, and so a thorough search of the building was undertaken. While no noxious fumes could be detected by any technical means, the source was finally traced by building engineers to an improperly installed motor-driven ventilator. The engineers at first thought that this motor might be emitting noxious fumes, possibly evaporated oils and lubricants. But no evaporated products were ever detected. It was found that the loosely poised low speed motor, poised in its cavernous duct of several stories, was developing "nauseating vibrations".

The mystery magnified for Dr. Gavreau and his team, when they tried to measure the sound intensity and pitch. Failing to register any acoustic readings at all, the team doubted the assessment of the building engineers. Nevertheless, closing the windows blocked the sense of nausea. In a step of brilliant scientific reasoning, Gavreau and his colleagues realized that the sound with which they were dealing was so low in pitch that it could not register on any available microphonic detector. The data was costly to the crew.

They could not pursue the "search" for long time periods. During the very course of tracking the sound down, an accidental direct exposure rendered them all extremely ill for hours. When finally measured, it was found that a low intensity pitch of a fundamental 7 cycles per second was being produced. Furthermore, this infrasonic pitch was not one of great intensity either. It became obvious that the slow vibrating motor was activating an infrasonic resonant mode in the large concrete duct. Operating as the vibrating "tongue" of an immense "organ pipe", the rattling motor produced nauseating infrasound. Coupled with the rest of the concrete building, a cavernous industrial enclosure, the vibrating air column formed a bizarre infrasonic "amplifier".

Knowledge of this infrasonic configuration also explained why shutting the windows was mildly effective in "blocking the malady". The windows altered the total resonant profile of the building, shifting the infrasonic pitch and intensity. Since this time, others have noted the personally damaging effects of such infrasonic generation in office buildings and industrial facilities. The nauseat-

ing effects of exposure to a low intensity natural or manmade infrasonic source is now well appreciated.

It has become a routine architectural procedure to seek out and alter any possible such resonant cavities. The sources often appear in older buildings, the result of construction rendered faulty by previous lack of this knowledge. All such "improper" architectural formats are modified by the additions of sound-blocking materials.

WHISTLES

Dr. Gavreau and his research team now carefully investigated the effects of their "infrasonic organ" at various intensity levels and pitch. Changing the spring tension on shock mounts which held the fan motor, it was possible to change the pitch. Various infrasonic resonances were established throughout the large research building. Shutting the windows blocked most of the symptoms. When the window was again opened, however weak as the source was made, the team felt the nauseating effects once again.

In the business of military research, Dr. Gavreau believed he had discovered a new and previously "unknown weapon" in these infrasounds. Aware of the natural explosives by which infrasonics are generated, Dr. Gavreau began to speculate on the application of infrasonics as a defense initiative. The haphazard explosive effects of natural infrasound in thunderclaps were quite effective in demonstrating what an artificial "thunder-maker" could do. But, how could a thunderclap be artificially generated in a compact system? These thoughts stimulated theoretical discussions on the possibility of producing coherent infrasound: an infrasonic "laser".

The first devices Dr. Gavreau implemented were designed to imitate the "accident" which first made his research group aware of infrasonics. They designed real organ pipes of exceedingly great width and length. The first of these was six feet in diameter and seventy five feet long. These designs were tested outdoors, securely propped against protective sound-absorbent walls. The investigators stood at a great distance. Two forms of these infrasonic organ pipes were built. The first utilized a drive piston which pulsed the pipe output. The second utilized compressed air in a more conventional manner.

The main resonant frequency of these pipes occurred in the "range of death", found to lie between three and seven cycles per second. These sounds could not be humanly heard, a distinct advantage for a defense system. The effects were felt however. The symptoms come on rapidly and unexpectedly, though the pipes were operating for a few seconds. Their pressure waves impacted against the entire body in a terrible and inescapable grip. The grip was a pressure which came in on one from all sides simultaneously, an envelope of death.

Next came the pain, dull infrasonic pressure against the eyes and ears. Then came a frightening manifestation on the material supports of the device itself. With sustained operation of the pipe, a sudden rumble rocked the area, nearly destroying the test building. Every pillar and joint of the massive structure bolted and moved. One of the technicians managed to ignore the pain enough to shut down the power supply.

These experiments with infrasonics were as dangerous as those early investigations of nuclear energy. Dr. Gavreau and his associates were dangerously ill for nearly a day after these preliminary tests. These maladies were sustained for hours after the device was

turned off. Infrasonic assaults on the body are the more lethal because they come with dreadful silence. The eyesight of Dr. Gavreau and his fellow workers were affected for days. More dangerously were their internal organs affected: the heart, lungs, stomach, intestinal cavity were filled with continual painful spasms for an equal time period.

Musculature convulses, torques, and tears were the symptoms of infrasonic exposure. All the resonant body cavities absorbed the self-destructive acoustic energy, and would have been torn apart had the power not been extinguished at that precise moment. The effectiveness of infrasound as a defense weapon of frightening power having been demonstrated "to satisfaction", more questions were asked. After this dreadful accident, approaching the equipment once again was almost a fearful exercise. How powerful could the output of an infrasonic device be raised before even the operating engineers were affected?

With greatest caution and respect for the power with which they worked, Dr. Gavreau began recalculating all of his design parameters. He had grossly misjudged the power released by the pipes. He had, in fact, greatly lowered those calculated outputs for diagnostic purposes. Never had he imagined that these figures were actually far too great in the world of infrasound!

Empirical data being the only way to determine how infrasonic energy correlated with both biological and material effect, the tests were again attempted with a miniature power supply. First, the dimensions of these devices had to be greatly reduced. Their extreme length was objectionable. In order to provide absolutely safe control of the deadly blasts, several emergency cutoff switches were provided. These responded to the radiated infrasonic pressure wave. The intensity could be absolutely limited by use of automated barometric switches.

In an attempt to achieve more compact and controllable infrasound generators, Dr. Gavreau designed and tested special horns and "whistles" of various volumes. These were each remarkably simple flat circular resonant cavities, having a side output duct. They were simply the large analogues of foghorns and police whistles. These flat forms were volumetrically reduced in successive design stages because it was found that their output was far too great. The infrasonic foghorns could produce a frightening two kilowatts of infrasonic energy, at a pitch of one hundred fifty cycles per second.

The flat "police whistles" were more easily designed to required specifications. Their overall characteristics were quite simple to determine, a mathematical formula being devised for the purpose. The whistle's resonant pitch was found by dividing its diameter into a numerical constant of 51. Increasing the depth of the whistle effectively increased its amplitude. A whistle 1.3 meters in diameter produced an infrasonic pitch of 37 cycles per second. This form violently shook the walls of the entire laboratory complex, though its intensity was less than 2 watts infrasonic power.

DANGER

Not much amplitude is required for infrasound to produce physiological malady. Several researchers accidentally did themselves great harm when, by deliberate intent or accident, they succeeded in generating infrasonic vibrations. Tesla used vibrating platforms as an aid to vitality. He delighted in "toning the body" with vibrational platforms of his own design. Mounted on heavy rubber

pads, these platforms were vibrated by simple motorized "eccentric" wheels.

Their mild use, for a minute, could be pleasantly stimulating. The effects invigorating the whole body for hours thereafter. Excessive use would produce grave illness however, excessive aggravations of the heart being the most dangerous aspect of the stimulation. The entire body "rang" for hours with an elevated heart rate and greatly stimulated blood pressure. The effects could be deadly.

In one historic instance, Samuel Clemens, Tesla's close friend, refused to descend from the vibrating platform. Tesla was sorry he had allowed him to mount it. After repeated warnings, Tesla's concern was drowned out by both the vibrating machine and Clemens' jubilant exaltations and praises. Several more seconds and Clemens nearly soiled his white suit, the effects of infrasound being "duly recorded".

Tesla often went to great lengths in describing the effects of infrasounds to newspaper reporters who, behind his back, scoffed at the notion that a "little sound" could effect such devastations. Yet, it was precisely with such a "little sound" that Tesla nearly brought down his laboratory on Houston Street. His compact infrasonic impulsive weapons were terribly efficient. Tesla later designed and tested infrasonic impulse weapons capable of wrecking buildings and whole cities on command.

Walt Disney and his artists were once made seriously ill when a sound effect, intended for a short cartoon scene, was slowed down several times on a tape machine and amplified through a theater sound system. The original sound source was a soldering iron, whose buzzing 60 cycle tone was lowered five times to 12 cycles. This tone produced a lingering nausea in the crew which lasted for days.

Physiology seems to remain paralyzed by infrasound. Infrasound stimulates middle ear disruptions, ruining organismic equilibrium. The effect is like severe and prolonged seasickness. Infrasound immobilizes its victims. Restoration to normal vitality requires several hours, or even days. Exposure to mild infrasound intensities produces illness, but increased intensities result in death. Alarming responses to infrasound have been accurately recorded by military medical experts.

Tolerances from 40 to 100 cycles per second have been recorded by military examiners. The results are sobering ones. As infrasonic pitches decrease, the deadly symptoms increase. Altered cardiac rhythms, with pulse rates rising to 40 percent of their rest values, are the precursors to other pre-lethal states. Mild nausea, giddiness, skin flushing, and body tingling occur at 100 cycles per second. Vertigo, anxiety, extreme fatigue, throat pressure, and respiratory dysfunction follow. Coughing, severe sternal pressure, choking, excessive salivation, extreme swallowing pains, inability to breathe, headache, and abdominal pain occur between 60 and 73 cycles per second. Post exposure fatigue is marked. Certain subjects continued to cough for half an hour, while many continued the skin-flush manifestation for up to four hours.

Significant visual acuity decrements are noted when humans are exposed to infrasounds between 43 and 73 cycles per second. Intelligibility scores for persons exposed, fall to a low of 77 percent their normal scores. Spatial orientation becomes completely distorted. Muscular coordination and equilibrium falter considerably. Depressed manual dexterity and slurred speech have been noted

before individuals blackout. Just before this point, a significant loss in intelligibility is noted.

The findings of Dr. Gavreau in the infrasonic range between 1 and 10 cycles per second are truly shocking. Lethal infrasonic pitch lies in the 7 cycle range. Small amplitude increases affect human behavior in this pitch range. Intellectual activity is first inhibited, blocked, and then destroyed. As the amplitude is increased, several disconcerting responses had been noted. These responses begin as complete neurological interference. The action of the medulla is physiologically blocked, its autonomic functions cease.

WATCHMEN

Infrasound clings to the ground, a phenomenon well known in the animal world. Female vocalizations and those of their young, take their traceable routes through the air. High pitched sounds are aerial in nature. This makes females and young natural targets for predators. Low pitched tones cling to the ground, being "guided" along the soil layers. Male vocalizations cannot be localized by predators. Male sounds "hug the ground", diffusing out from their source. Some males rumble the ground with voice and hooves. These are communications signals which they alone comprehend.

The fact that the ground draws and guides low frequency tones is a remarkable gift to the animal kingdom, enhancing the survival of male leaders. When herds are attacked by predators, the males can continue to give guidance to their companions, while remaining completely "invisible" and elusive. Predators cannot locate the voices and rumblings of male leaders because their low pitched signals are impossible to pinpoint. They are therefore also impossible to attack. Predators are often overtaken by the males who maintain their diffusive communications across and through the ground.

The same analogies would apply to an infrasonic defense system. First, infrasound does not lose its intensity when travelling very long distances across the ground. They remain at the same intensity as when released from their deadly sources. Also, because of the ground clinging effect, infrasonic sources cannot be located without special appliances. This would work well for those who used the weaponry of infrasound. But suppose some hostile force were themselves using infrasonics? Infrasonics are inaudible. The battle would be over before anyone knew it had begun. How would one know of an infrasonic attack? The first line of defense would therefore be the detection of the "unperceived enemy". The development of an adequate infrasonic weapons systems would first require an infrasound detector.

Dr. Gavreau first concentrated on developing infallible infrasonic detectors for the personal safety of his operators as well as for eventual tactical deployment. He experimented with several designs which followed the arcane analogues of old wireless detectors. One such design used enclosed flames to detect infrasonic pitches. They were reminiscent of those flame detectors developed by Lee De Forest just before his invention of the triode. The flame detectors of Gavreau employed variable resonant cavities. Flame amplitudes shifted with specific infrasonic pitches. He could calibrate the infrasonic intensity as well as the pitch with these detectors. But, flames are dangerous and fickle, not being very reliable in battle.

Dr. Gavreau next experimented with enhanced mechanical barometers. These coupled large resonant cavities with very fine

barometer tubes. They displayed great sensitivity. Steady increases in barometric pressure were registered when large cavity bellows were compressed by infrasonics. The sensitivity of these barometers increased as the bellows capacity was increased. They were adequate, but frail.

Another embodiment resembled the early mechanical television designs of John Logie Baird. It utilized large tympani skins, mirrors, lights, and photocells. A mirror was fastened to the tympanum. A light beam flickered when infrasound struck the mirror. The photocell recorded these flickers as an electrical signal. This detector system was very reliable.

By far, the most advanced detectors which Gavreau designed and tested utilized an electrolytic process. In this analogue of systems developed by Fessenden to measure faint wireless signals, chemical solutions and fine wirepoint electrical contacts were used. Chemical solutions, separated by an osmotic barrier, were forced to migrate through the barriers whenever infrasound traversed the system. This chemical mixture was then measured as an increased electrical conductivity in a sensitive galvanometer. This system was reliable and accurate. All of these systems suffered from one possibility. The offensive use of an incredible infrasonic amplitude would burst them into vapor.

ARMOR

Claims were issued by french authorities, stating that Dr. Gavreau was not developing weapons at all. Several patents, however, betray this conspicuous smoke-screen. While it is impossible to retrieve the actual patents for the infrasonic generators, Dr. Gavreau is credited with extensive development of "infrasonic armor". Why would he "waste" such time and expense if not for an anti-weapons program?

Thus use of infrasonic weaponry necessitates the development and implementation of infrasonic shields. Dr. Gavreau spent more time developing infrasonic shields than on developing efficient infrasonic horns. Infrasound could not adequately be blocked, as Dr. Gavreau discovered early in his research. Infrasonic devices require extremely large baffles.

Furthermore, no one would dare initiate an infrasonic barrage on any invasive force without adequate protection. Infrasonic horns can project their sounds in a given direction, but natural environments "leak" portions of the sound in all directions. Infrasonics saturate their generators, flooding and permeating their sources in a few seconds. They "work their way back" toward those who dispatch their deadly signals. Infrasonics "hug the ground" and spread around their sources. Unfortunately, those who would release infrasonic energy would themselves be slaughtered in the very act.

The first method of Gavreau involves the conversion of infrasound into successively higher pitches, until the infrasonic pitch is "lost". This was achieved in his passive "structural" method, an enormous layered series of baffles and resonant cavities. This form is "passive" since it merely stands and waits for infrasonic barrages, absorbing and converting them into harmless audible tones.

The second method of Gavreau is more active and "aggressive". It actively engages and nullifies any offensive infrasonic power. The nullifier uses a well known physical principle for its operation. As an "active" shield, it transmits tones whose opposing wavefronts destructively interfere with incoming infrasound. Infrasonic attacks are

nullified, or at least brought to much weaker levels.

This method requires high speed detection and response systems. The process involves determination of an attack pitch, generation of the same, and projection of the pitch "out of phase". The active nullifier method is not completely accurate or protective by any means. A highly modulated, mobile infrasonic source would be nearly impossible to successfully neutralize without extremely sophisticated electronics.

But an elegantly simple approach was imagined, one which would not require the defender to be exposed to his own infrasonic projections. While fixated on the old notion of gun installations and stations, Gavreau and the team had momentarily forgotten their first research endeavor. Robotics!

THE HAMMER

Let us recall that Dr. Gavreau and his team of pioneers were in the business of robotics. They developed industrial and military automaton systems. How difficult would it have been to couple his newfound weaponry with robotic applications? Dr. Gavreau combined the organ pipe and whistle format. The device was housed in a block of concrete. It was less than a cubic meter in volume. The primary whistle was poised within its interior. At its flared opening were placed several resonant pipes. The device was operated by highly compressed air. Its output was frightful. It was capable, in a conventional engagement, of utterly destroying an aggressor.

This infrasound whistle design was once sealed in an 880 pound concrete pier for tests, a concrete baffle placed over its projective end. Even with these precautions, the device succeeded in absolutely shaking a fan-shaped portion of Marseille. It broke through its supportive concrete pier and destroyed the baffle covering in an instant. Macabre. No sound was ever heard.

This design demonstrated great pitch selectivity, power, and directivity. In this last feature, Gavreau and his team achieved a safety factor of greatest value. Infrasonic defensive armaments could now be safely directed away from the operators against any foe. This weapon was a remarkably compact and efficient device. Its efficiency was gauged by the destructive output and the weapon volume.

A later embodiment of this terror disclosed another compact cube. The infrasonic whistle was presumably housed therein. Proceeding from the front plate were some sixty pipes, flared horns aimed in deadly forward array. It was said that this device alone, remotely guided into an arranged artificial battlefield, burst heavy battlements and tank interiors open with a hideous effortlessness. In addition, several other more frightening and unmentionable disruptions were observed with equal effectiveness. In each, not a sound was ever heard.

The device was mounted and mobilized. A robotic vehicle. Powered by diesel engines or compressed gas, the almost insignificant unit would be a bizarre foe for an army to engage. Preliminary experiments had proven the extreme danger of losing infrasonic power among Gavreau and his workers. Without automatic remote control mechanisms each technician would succumb to the deadly sound and die, while the machine kept broadcasting its deadly sound. As defensive weaponry, such a device would be terrible and effective. The system would be a true deterrent for those who would be foolish enough to attempt ground assault on any nation so armed.

Armies would fall flat. Once the infrasonic horns were unleashed against the foe, the battle would not even begin.

Such a war engine would be impossible to locate. None who saw its size would believe it to contain such a lethal power. Most would overlook the device completely. A flood of such devices, each emanating a peculiar highly modulated blend of infrasound, would be an unstoppable wall. Robotic tanks equipped with infrasonic generators could sweep an area with deadly infrasound, destroying all opponents to within a five mile radius. These terrible infrasonic weapons could easily be secured in drone jets, where aerial assaults could quickly and methodically waste any offensive approaching army.

Detering would-be aerial attackers could be equally devastating for the offenders. Infrasonic beacons could sweep and scan the skies with a deadly accuracy. Infrasound passes through all matter with equal effectiveness, seeking out offenders with deadly consequence. The intensities which the Gavreau devices effectively broadcast into the environment are frightening. In these devices we see the perfection of phenomena which never naturally occur in such dangerous intensities. This is why these weapons must be deployed by remote control, operating as automatons at great distances from their operators.

Weapons are made to defend, not to offend. In Gavreau's own words: "There does not exist complete protection against infrasound. It is not absorbed by ordinary matter, walls and chambers do not suffice to arrest it". And so, once again, we stand at the cross-roads. We are called, summoned to appear before two pathways. On the one, we hear Messaien and the musical messages of peace. On the other, Gavreau and the musical messages of war. And again we choose. And again we must choose. Whose music will it be? □

GERRY VASSILATOS began writing for *Borderlands* magazine several years ago. He is the producer of the *Ray of Discovery* video documentary series, *Aura Motors*, *Earth Tones* (with Michael Theroux), and is also the author of the *Vril Compendium* (a borderland research encyclopedia which now totals 11 volumes). Recent works include *Secrets of Cold War Technology - Project HAARP and Beyond*, and the new reference work, *Declassified Patents of the Cold War and SDI*. As an avid experimenter, patent researcher, and radio historian, Mr. Vassilatos has contributed to several advancements in a wide variety of fields of borderland research. This is his sixth biography in an ongoing series of borderland researchers soon to be compiled into a new paperback book entitled *Last Science*.

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Project HAARP and Beyond

Gerry Vassilatos

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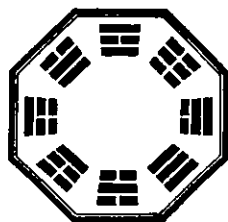
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Design



Ecology

OUR INVISIBLE ENVIRONMENT

Part II from the book *Design Ecology*

by Michael Riversong

FEW issues have created as much controversy in recent years as the debate about health consequences of electromagnetic fields. We know some people are profoundly affected by electromagnetic fields. Possible mechanisms for these effects have been proposed, and research shows it is plausible these fields could create disturbances at the cellular level. However, specific details of interactions are not yet known for certain by any authority. At this point, it is safe to say that sensitivity to electromagnetic fields is an individual trait, varying widely from one person to another. Therefore, a measured level which could cause great harm to one person may actually enhance health in another.

FIELD CHARACTERISTICS

Electromagnetic fields are complex. When you push electrons through a wire, a number of things happen. When you smash electrons into a screen, like a TV or computer monitor, even more things happen. Generally, three components come together in varying degrees in an electromagnetic field. First, there is a pure magnetic field, which acts in some ways like the magnetic field from a natural magnet. Second, air becomes charged with varying levels of "space charge", which is pure electricity. Third, ionization occurs, which means a number of molecules of air actually change their individual charges, sometimes hurting people by drawing electrons from the body.

MEASUREMENT

Most consultants and researchers use gaussmeters, which measure the pure magnetic field, as the main measuring tool. There are wide variations in quality among gaussmeters. One of the best currently available is the MEDA, which measures magnetic fields in three frequency ranges. Field-strength meters, which measure the amount of electric charge in the air, are important. Electrical charges in air do not necessarily correlate with magnetic fields, although either may have an impact on health. Ion detectors are rarely used, because ionization can be created by factors other than electromag-

netic fields, the amount of ions created in electrical wiring is usually small, and the meters are extremely expensive.

High-frequency measurements are a whole subject in themselves. Accurate field strength levels can only be found with terribly expensive equipment usually only used by military and communications groups. Relative measurements can be gained with a special accessory antenna made in Germany and attached to a digital multimeter. Also, ordinary automobile wideband radar detectors, run with an AC power adaptor inside a building, can sometimes be useful.

SAFE LEVELS

In Europe, magnetic field safety standards of 2.5 milligauss are generally accepted by government authorities. Electric field standards vary widely from one country to another, but a level below 20 millivolts per meter (mV/m) should be safe. For most people, only personal experience will actually determine the maximum safe level. Anyone who is under a lot of external stress will want to minimize exposure to electromagnetic fields, as a precaution. The fields have a greater effect during sleep, so cutting off all electricity to the bedroom at that time can have a good effect on people.

ELECTROMAGNETIC FIELD SURVEY TECHNIQUES

Since 1990, I have been doing electromagnetic surveys of homes, offices, and properties. During that time, many fascinating situations have been encountered. This is a report from the front lines of the struggle for better health and well-being.

Plenty of controversy exists concerning the possible effects of electromagnetic fields emanating from our power system. As fans of Nikola Tesla already know, the American power distribution system is largely a series of historical accidents, and was never intended to be the final word in electrical transmission. So what we have now in this country is a standard frequency of 60 cycles per second, and several levels of step-down voltage between the time power comes off the dynamo and it gets to our homes and businesses. Each part of the process produces some wasted energy, usually in the form of electromagnetic fields that can endanger life and health.

Saying that electromagnetic fields are dangerous is considered inflammatory in some circles. However, plenty of research exists to indicate that this is at least a possibility. Even the United States Government Printing Office has made available a background paper called "Biological Effects of Power Frequency Electric and Magnetic Fields", which contains citations of many good studies. Several books available through High Energy Enterprises also give a lot of good information on the research to date. When something gets this high up in the chain of scientific evidence, it's good to pay attention. However, there's no substitute for experience in the field.

MAGNETIC FIELDS

One of my most dramatic cases involved a small newspaper office in Wyoming. A few of the employees had intermittent health problems. When these problems are impossible for doctors to track down, and they involve mysterious pains that appear and disappear with no particular pattern, then electromagnetic fields should at least be considered as a possible factor. The editor commented that he

didn't like being in his office much, and then he mentioned how there had been a high turnover in his job. I asked what had happened to the previous editors. Many of them had resigned due to health problems, and at least one had died. Magnetic field levels at his desk were around 10 milligauss. The office was next door to an appliance store, and fields from several display units, including TVs and refrigerators, were coming right through the wall. He had been thinking of remodelling the building, and a less stressful spot was found for his new office. Meanwhile, he arranged to do as much work as possible in other locations.

In Kentucky, a young woman experienced severe headaches every time she came home from college for a visit. We took the gaussmeter downstairs to her bedroom, and most of the measurements were at normal background levels. The exception was at the head of the bed, around her pillow, where readings between 5 and 11 milligauss were found. Nothing in the room could account for



The author finding a 10.1 milliGauss reading under a powerline in Lakewood, Colorado. (Photo by Trace Hanover)

the fields. Finally, I went around to the room directly on the other side of the wall. An attractive motorized clock, dating from around 1955, was sitting on the shelf directly behind where her bed was. We moved the clock to another spot, far away from any bedrooms, and her headaches stopped.

These two incidents point out the effects of one kind of field emanating from the power transmission system, the magnetic field. This field is an alternating current phenomenon. In DC systems, magnetic fields also occur, but usually not with the strength you find in AC systems. You can expect to find AC magnetic fields emanating from motors, transformers (like the ones used for calculators), power service feeds, and some clocks. According to the Swedish government exposure standards, which are the best-researched in the world, 2.5 milligauss (mG) is the maximum safe exposure level. Of course, some people are sensitive to lower levels, and others can tolerate much higher levels. The Swedish standard is a good guideline for clients. It can be difficult to get below that level with mitigation measures anyway.

ELECTRIC FIELDS

In an insurance office near Denver, a woman was experiencing several stress-related health problems. She reported that she never felt comfortable at her desk. An electric typewriter was on a counter next to her. It was normally used about five minutes a day, and was turned off the rest of the time. Even when turned off, it was emanating a level of 31 Volts per meter of electric field, and this was with a crude meter setup! No other significant electric or magnetic fields were found at her position. In many appliances, electricity flows to part of a transformer or motor even when turned off. This is especially true of electric typewriters and television sets. The solution is to put the offending appliance on an outlet strip, allowing you to cut the power off a few feet away from the problem area.

In America, most people who know about electromagnetic fields pay attention to only the magnetic field. (This is rarely the case in Europe.) Electric fields can often have serious health effects, since they are an actual charge in the air around us. They are difficult to measure, since the human body interacts with the fields. To do accurate measurements, it is best to set up a meter with a good ground wire running outside, and use a special antenna probe. Once the meter is set up, walk away and see how the field varies. A Fluke 87 digital multimeter is excellent for these measurements, because it's possible to make a recording of maximum, minimum, and average levels.

Electric fields can be highly variable, and completely disassociated from magnetic fields. High levels can be found around some, but not all, computer monitors. Normally, the more recently manufactured monitors show lower levels. This is a problem that can be specifically addressed with a product known as the No-Rad Shield, available through many computer stores and some specialized mail-order suppliers such as Healthful Hardware of Prescott, Arizona. When installing the shield, make sure it's grounded properly in order for it to work.

Other common sources of electric fields include lamps, digital clocks, heaters, and water pipes. The last source of electric fields brings up a big problem in this country, which is grounding of electrical systems. As Spark Burmaster said, "They're trying to draft every stray piece of metal in the United States into the electrical system." Grounding is absolutely necessary as a safety measure. However, running a ground to water pipes is not always necessary, and makes people susceptible to unwanted interference from neighbors, as the pipes carry residues of all kinds of electrical operations around a neighborhood. Sometimes it is necessary to isolate the main water pipe coming into a house with a short section of non-conducting PVC.

HIGH FREQUENCY FIELDS

High frequency fields are a growing problem all over the world, as cellular phones and microwaves become more pervasive. Until recently, it was difficult and expensive to measure them. We know there can be health problems associated with high levels of these fields, at frequencies between 30 mHz and 900 GHz. This is because in the early days of microwave communications several technicians working for the phone company actually had their internal organs cooked while stepping into the paths of operating microwave transmitters. Several died within days. Recent well-publicized litigation has also indicated that problems could exist with cellular



*How the Merkl high-frequency probe is used.
(Photo by Trace Hanover)*

phones, which may transmit high voltage levels directly into the brain while being used.

When using cellular phones, be aware that hand-held models are potentially the most dangerous. If you have to use one a lot, transportable models, which have the transmitting antenna attached to a separate battery pack unit, are safer. When phones are installed in cars with roof antennas, you're usually insulated from the actual signal by the metal roof. This means car phones are the safest.

Recently, an affordable microwave probe, which can be attached to any digital multimeter, has become available in America through the Institute for Bau-Biologie and Ecology. This German-made probe converts readings to DC volts. Typical sources of high-frequency waves include leaking microwaves, radar transmitters, cheap computers, some TV sets, and cellular phones. High frequencies travel more or less in lines of sight, especially at the higher ranges, and thus can sometimes be blocked with metal foil or metallized cloth.

SURVEY TECHNIQUES

When doing electromagnetic field surveys, it is important to use good equipment and prioritize your time. The common "Tri-Field" meters are easy to obtain and relatively inexpensive, but they are not very accurate and so are best suited for hobbyists. Reputable consultants in this field typically use one or two digital multimeters with special probes, a high-quality gaussmeter, and several other accessories. The amount of equipment that can be used is endless, and any aspiring consultant can be assured that whatever is purchased today will be obsolete tomorrow. Training and experience are necessary to effectively interpret measurements.

Home surveys should always start in the bedroom. This is vital, because we depend on our nightly sleep for renewal of all biological systems. To get reliable measurements of electric fields, a temporary meter ground should be run outside to

a temporary copper stake whenever possible. Sometimes, a ground wire to the home system will have to do, but make sure you check the outlet first! Occasionally, I've grounded the meter to water heat radiators with passable results.

In a workplace, pay the most attention to any spot where someone needs to stay for long periods of time. Watch out for copy machines, calculator transformers underneath desks, and electric typewriters. I try to schedule office surveys during normal working hours, and still disrupt routines as little as possible. It's tricky, but this is the only way to get meaningful readings in such an environment. Home surveys are usually scheduled in the evenings, when the whole family tends to be around and electric use in the neighborhood normally is at its peak.

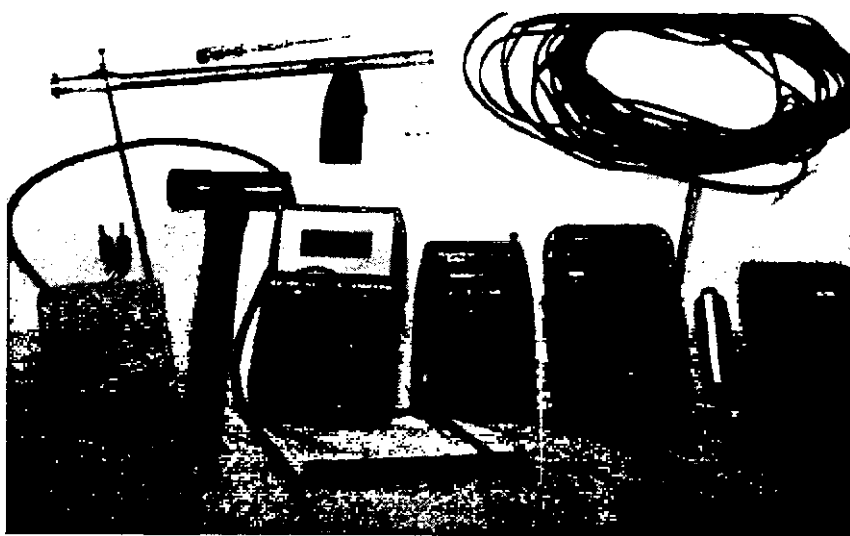
MITIGATION MEASURES

Sometimes, simply moving appliances will take care of problems. We're lucky when we can get off that easily. In more difficult cases, turning off electrical power at night, at the circuit breaker or fusebox, will be recommended.

Many people have experienced sudden, dramatic improvements in health when taking control of their electrical environment in this way. When the power feed is inconveniently located, special relays can be installed by an electrician to allow power to be switched off from a remote control by the bed.

In more difficult situations, especially those involving high frequency waves, metal foil or specially treated plastic sheeting may need to be used. As a last resort, moving out may be recommended, in the hope that the next person to live there will be one who is not so sensitive to electromagnetic fields.

Experiments are constantly being done in mitigation methods. These are highly technical, but many involve different shapes of wire. Dr. Glen Rein, while working with the Institute for HeartMath in Boulder Creek, California, a great deal of pioneering research in this area. His experiments indicated that certain wire shapes, mainly based on spirals, Moebius strips, or caduceus coils, may indeed reduce or cancel electromagnetic fields under some circumstances.



An array of electromagnetic test equipment.



Dr. Glen Rein at work in the laboratory at the Institute of HeartMath, Boulder Creek California, October 1993.

Electromagnetic surveys are a complex issue. No matter how much you learn, there's another surprise waiting around the corner. Sometimes, fields will be found in mid-air, with no apparent source. Electrical potential in the human body is also measurable, and comparisons between people and between different locations in a building are often useful. I've learned to expect the unexpected, because our technology has gotten pretty complicated, and you never know what kind of invisible demons have sprung forth.

WHO NEEDS AN ELECTROMAGNETIC SURVEY?

Any building connected to the American 60 Hz power grid has a potential for harboring high electromagnetic field levels. According to many current researchers, any high electromagnetic field level has a potential for threatening health. There are two broad reasons why an electromagnetic survey should be ordered: health and location.

HEALTH

If someone is experiencing health problems associated with a home or office, then an electromagnetic survey should be done as part of a total environmental evaluation program. This should be done with the full knowledge and cooperation of any therapist involved.

According to several health care providers, symptoms possibly associated with electromagnetic fields include: headaches, vertigo, inability to concentrate, irritability, immune system suppression, and, in extreme cases, tumors or cancer. Since any of these symptoms can arise from a variety of causes, the therapist's role in these situations is obvious.

Three things must be considered when evaluating the role of a building in a health problem:

1. Did the problem start shortly after the association with the building began?
2. Does it go away when a person is away from there?
3. Did the symptoms fail to respond to the treatment program as expected?

LOCATION

Certain building locations ought to be checked for electromagnetic fields as a matter of course, especially in a pre-sale situation. Then, people who are known to be immune to electromagnetic fields can choose those buildings safely, and others can avoid them.

Near large powerlines

Any transmission line with large metal towers can radiate electromagnetic fields for some distance. The distance varies with line capacity, actual line usage, and weather. Measurable effects may be found up to 1/2 mile on either side of a line.

Near primary feeders

These lines often run through neighborhoods unnoticed. They are usually on slightly taller poles than regular lines, and are somewhat thicker. The wires tend to be silvery in color, with larger insulators. They are used to carry current out to smaller branches farther from generating or transformer stations. Generally, effects are seen for about 500 yards on either side.

Around transformer stations

Any unusually large electrical boxes are suspect. Stepdown transformer arrays situated in residential neighborhoods are a special problem. They have been known to create measurable fields for several blocks in any direction, depending on size. Regular residential transformer boxes are not a problem unless they're unusually close to sleeping or working areas.

Older facilities

As a rule of thumb, the older a facility, the more likely it is to be generating heavy electromagnetic fields. Even the smaller residential pole transformer cans, which are usually not a problem, can emanate distorted energy patterns when they deteriorate.

Older houses with several layers of wiring should be checked, because unusually high field levels can come from improperly connected plugs and junction boxes. Sometimes, a full electromagnetic field survey has uncovered dangerous wiring problems.

RADAR AND MICROWAVES

Houses in the path of microwave beams and radar facilities will sometimes have unusually high levels in these ranges. If a microwave or radar tower can be directly seen from the house in any direction, pay special attention to this. In some cases, such as near airports and military installations, radar pollution will pervade the entire environment for miles around. This will even show up on automobile radar detectors, which are not that sensitive. □

MICHAEL RIVERSONG has a degree in Chinese language from the University of Colorado, and is a recognized expert on the design art of Feng Shui. He has been a musician since childhood. Since 1984, he has recorded over 13 albums of his original music on harp, flute, guitar, and other instruments. He is the author of *Design Ecology* (available from BSRF — see page 54), a compendium of information and techniques for dealing with environmental situations. Michael currently travels extensively, performing, writing, and providing design consulting services.

VISIONARY PERSPECTIVES

An Interview with John Major Jenkins

by R.F. Paul

Reprinted with permission from Esotera Magazine #6 – Spring/Summer 1996

JOHN MAJOR JENKINS is an independent student of Mayan time. Having authored numerous articles and four books on Mayan cosmology including *Tzolkin: Visionary Perspectives and Calendar Studies* (Borderland Sciences Research Foundation, 1994), Jenkins emphasizes the visionary or mystical element in Mayan studies while celebrating the authentic Mayan Calendar traditions, still surviving today in the remote villages of Central America. Check out his website at: <http://phidias.colorado.edu/jenkins/fourahau.html>

Robert Paul: How and when did you first become interested in the Maya?

John Major Jenkins: I've always been interested in ancient philosophy, esoteric wisdom and cosmology. Back around 1986, my general interest in Native American beliefs got narrowed down to the Maya, as they seemed advanced in ways that scholars were not even able to talk about. I had read Frank Waters' books on the Hopi and then his book *Mexico Mystique* (1975). That addressed some interesting possibilities, and piqued my curiosity about the end-date. So, in 1986, I saved a little cash, quit my factory job, and headed south of the border for a few months. I had also read some of Barbara Tedlock's *Time and the Highland Maya* (1982), which talked about her apprenticeship to a daykeeper in the highlands of Guatemala in the mid-1970's. This is a very interesting book, but at that time I didn't understand a lot of what she was describing. It did tell me, however, that the Maya and their calendar traditions were alive and well in the remote villages of Guatemala. So that's where I went. I was gone for 4 months and got back completely broke after spending a week in jail, but that's another story.

RP: How long have you been involved in the study of Mayan Calendrics?

JMJ: So many crazy things happened on that first trip to Central America that in 1988 I decided to write about it. It was going to be just a travelogue kind of thing that I would give to my friends and family. But I thought I should present something about the calendar too, so a little research became a lot of research and, in fact, I got very absorbed in working with what I call "Mayan time philosophy" and a "big picture" understanding of what the calendar is all about emerged. One question led to another and I've been pursuing various mysteries related to the calendar pretty intensely since then.

RP: For the benefit of our readers, could you give a brief overview of the workings of the Mayan Sacred Calendar? Describe its timekeeping and astrology.

JMJ: The "key" to Mayan time is the sacred cycle of 260 days, the tzolkin. The word "tzolkin" is derived from the Mayan term "chol kij" — count of days. This cycle is a combination of 20-daysigns with a number from 1 to 13. So 13 and 20 are the critical numbers of the tzolkin "key." They advance together in the following way. Today is October 24th, 1995. Daykeepers among many different Mayan groups will tell you that today is 2 Eb. "Eb" refers to the daysign generally translated as "tooth". Tomorrow will be 3 Ben, and the day after that is 4 Ix and so on. After 260 days we get back to 2 Eb. 260 is a key number which refers to processes in the heavens as well as on earth. For example, the Maya say that it corresponds to the cycle of human gestation — that's a biological reference. It also corresponds to the time between the planting and harvesting of corn at a certain elevation in the highlands — that's agricultural. It also times religious shrine ceremonies in the hills around Mayan villages. Daykeepers and other calendar-priests go to certain shrines on certain days in the tzolkin calendar to perform shrine offerings and commune with Nantat, the ancestors, and El Mundo, the Earth Lord. This is, you might say, a religious use. Its celestial or astronomical uses are astounding. It is used to track the phases of the moon. Also, 2 cycles of 260 days equal 520 days and this equals 3 eclipses. So the Maya predict eclipses by using the tzolkin in this very simple way. Likewise, they track Venus with the tzolkin, and the time between the eveningstar appearance of Venus and its appearance as morningstar is 258 days. The other time cycle used by the Maya is the vague solar year of 365-days known as the "haab". While the tzolkin is the mysterious multidimensional "key", you might say that the haab is the mundane or "secular" calendar, primarily used to schedule secular holidays and so forth. The framework of days created by the combined tzolkin-haab is like a loom on which the movements of Mars, Saturn, Jupiter — even Uranus and Neptune can be tracked. It is a sacred-secular or solar-lunar synthesis. The full tzolkin-haab cycle is completed once every 52 years. This was the Calendar Round and the Aztecs observed the Pleiades pass through the zenith at the end of each one of these. The ceremony revolving around this event was called the New Fire Ceremony.

In general then, the tzolkin is the "key" to both terrestrial and celestial processes. It's kind of the common modulator or common denominator of the two realms. This is how we can understand

Mayan astrology. They discovered the numerical and ritual key. Most important in the astrology of all this is the reference to the human gestation period. As such, our own basic and shared rhythm of unfolding is seen to be intimately related to the cycles of the planets, moon and sun. This is more than just planets "influencing" us — rather, we share the same rhythm of unfolding that the planets do because, ultimately, everything springs from the same source. Everything, on some level, has been imparted with the same rhythm of unfolding and is therefore related by a form of synchronistic correspondence. According to the Maya, the common source is the Sacred Tree — the Axis Mundi.

RP: How much of an influence was Jose Arguelles on your work?

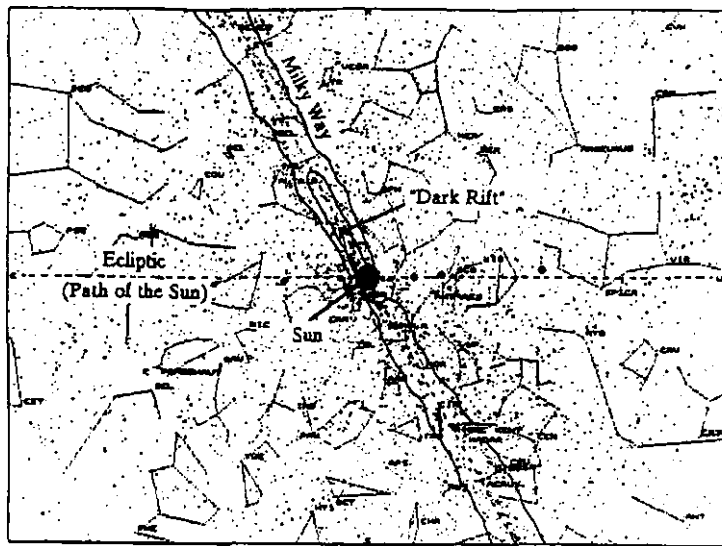
JMJ: Initially, *The Mayan Factor* (1987) kind of gave permission to interpret things in a visionary way. Some of Arguelles' early ideas are insightful and valuable. For example, the term "Harmonic Module" for the tzolkin speaks for its deeper meanings. His work with the 8 x 8 magic squares and the numbers 64 and 260 led me to some interesting discoveries regarding one of the "core principles" of the tzolkin, the Golden Mean. Strangely, however, Arguelles never really explored how the Golden Mean operates within the tzolkin. The mathematics get pretty intense. So, *The Mayan Factor* was part of my early reading, and I suppose it influenced that first travelogue, *Journey to the Mayan Underworld*, that I finished in late 1989.

In all fairness, Arguelles was early on a clear visionary voice, and for whatever reason he did appeal to so many people that the infamous Harmonic Convergence in August of '87 was something of a phenomenon. However, things have changed and it seems Jose has taken some wrong turns. In *The Mayan Factor* there isn't much of a distinction made between his visionary myth-making and what should be called ethno-historic fact. As such, there is a credibility deficiency due to lack of documentation. I think there is a place for visionary speculating, taking a study such as the Mayan calendar beyond what we can read about in academic books. A complex system of symbols and applications such as the tzolkin encodes certainly can be worked with in such a way. However, you are obliged to distinguish between what is surely "Mayan" and what is derived therefrom. If you don't, then you're cooking a pretty messy stew. So a lot of people are confusing what Jose Arguelles says with what the Mayas say. This is especially irresponsible because the Maya are still here! This translates into appropriation and disrespect for a living tradition. As such, Jose's words are now treated by his

followers with a kind of cultic inviolability, when in fact they have increasingly become misconceptions which serve the dubious agenda of one theocratic leader. Jose has entered the game of spiritual politics and as we know, politicians just tell people what they think they want to hear — rarely the truth.

RP: You point out in your book *Tzolkin: Visionary Perspectives and Calendar Studies* (1992, 1994) the many discrepancies of fact within Jose Arguelles' so-called Dreamspell game/oracle. Has the game been improved at all? Is Jose a genuine visionary or an exploitive con-man?

JMJ: One interesting result of having clearly exposed the errors of Dreamspell is that many people involved in Dreamspell have written to me with their own questions. I've responded to probably a hundred letters from various "ex-Dreamspellers." Many had noticed the discrepancies themselves but were unsure of what the true Mayan tradition had to say. This is because, again, the seemingly purposeful blurring of the "Jose" and "Mayan" source of ideas. So, to answer your question, no, Jose has not sought to correct his misconceptions. But it does seem that he is aware of the confusion arising among his followers. His response is to issue press releases with ad-hoc solutions. For example, in order for Dreamspell to work, one has to ignore counting February 29th. Obviously, this is not very satisfying to most people and, in addition, no Mayan daykeeper would stand for just not counting a day. The response from Deception Central to this ridiculous situation was that February 29th is an artifact of the Gregorian Calendar,



The sky on December 21st, 2012 A.D. showing a rare astronomical alignment — the winter solstice sun is right in the "dark rift" in the Milky Way.

and thus it doesn't matter if we ignore it. How absurd! This is just one example of many. Ex-Dreamspellers have told me that a lot of people fascinated with Dreamspell don't give a hoot about Mayan tradition; they're into it as a kind of escape, like mindlessly playing video games or something. This jibes with the lack of response I've had in trying to contact members of the Dreamspell elite such as Aluna Joy Yaxkin, Randy Bruner and others. Aluna Joy publishes regularly in *Sedona Magazine*, including monthly calendars using Jose's count placement. My letters were invitational rather than adversarial. They don't want to hear what I have to say, and my only goal is to clarify for them what the authentic Mayan calendar tradition is all about. In other words, it's not my "opinion" against Jose's "opinion" — I speak for authentic Mayan tradition and the true tzolkin count. I can't say whether or not Jose is a con-man, but at least it doesn't seem that he has a grasp on the real effects of what he is

doing. If he is aware of the real effects, well, then we have a much scarier situation.

RP: What real effects?

JMJ: Dreamspell doesn't follow the authentic count of days. As of March 1st, 1996, the Dreamspell/Arguelles count will be 51 days out of synchrony with the true count. The Maya use the tzolkin count to time shrine ceremonies and so forth. The tzolkin generates the ritual field of sacred ceremony — a ritual field that has 3000 years of repetition behind it. This is the heart of Mayan spirituality. How do you disrupt that? Set up another count of days, trick thousands of people into putting energy *into that placement*, and send a dissonance wave into the true count. The real effects then, of Dreamspell, are tantamount to a ritual attack on authentic Mayan tradition. I talk about this in more detail in my essay called "The Key to the Dreamspell Agenda."

RP: In your book *Tzolkin* you present ideas such as the raising of synchronicity as both concept and reality to a 'respected status.' By this I take it as a worthy subject for academic/scientific research. What luck have you had in changing the minds of the established paradigm?

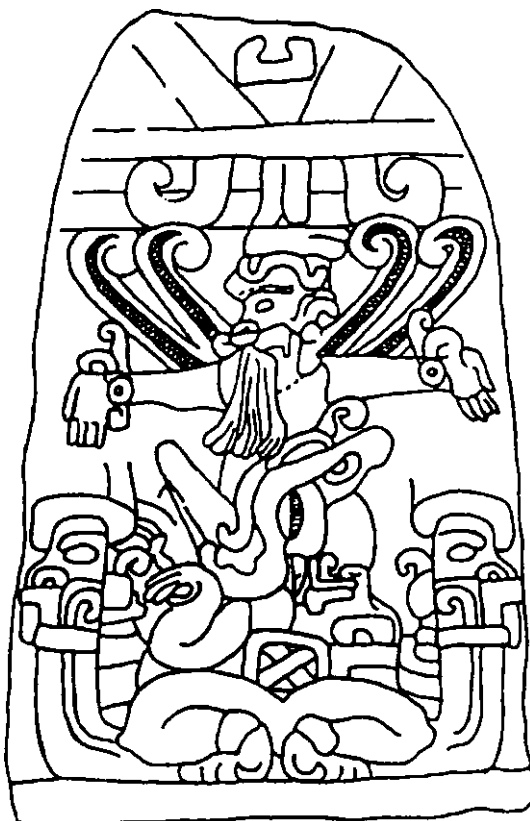
JMJ: Parapsychology has been studied with statistics and various tests. Astrology, for example, has been studied statistically by both J.B. Rhine and Carl Jung. Jung himself ran tests using tens of thousands of couples, testing for sun & moon aspects that traditional astrology said should be there. They were there, above statistical chance. This is a pretty simple experiment. The problem with synchronicity is that it can't be tested properly with the scientific method because it involves a factor of perceived subjective meaning. My ideas about synchronicity really fall into the category of metaphysics. It gets back to what I said earlier about the terrestrial and celestial realms being intrinsically interwoven, not via cause-and-effect, but because everything springs from the same source. Subjective and objective events spring from the same source, unfold with the same rhythm, and thus meaningful connections that seem to defy logic occur all the time. That is, unless you're repressing the magic. This is the "as above, so below" principle which ancient cultures understood as common sense. It's ironic that in our modern "advanced" age, one has to really squirm to language this principle, it goes so against the limited perspective of science that we've been indoctrinated with. Not to mention Christianity, which spent centuries giving magic a bad

name.

RP: You write in *Tzolkin* that "The tzolkin structures a hidden dimension, closer to the sacred spirit realms." Do you mean by this that the tzolkin "informs" the haab, lends to it patterns of influence and manifestation? Could the tzolkin be the source of the morphic resonance postulated by Rupert Sheldrake?

JMJ: I don't know if the tzolkin "informs" the haab, but you're right in saying that the tzolkin is the source of a morphic field. But it takes

the ritual feedback of ceremony to keep it rolling. And it is the key-rhythm or cycle which links us to the greater cosmos. When you track the tzolkin and follow the 13 x 20 daycount for long enough, observing carefully how it patterns events in your life, you begin to see how seemingly unrelated events — unrelated in space as well as time — are really very closely related. From the viewpoint above the linear march of time, events separated by years can be seen as two faces of the same trans-dimensional event. It seems strange but it's very human, because our minds are really multidimensional. We've been taught to forget that. The tzolkin is the subject-object interface, and because on one level its operations are mathematical, one can argue very solidly how this works. In my work, it has to do with the Golden Mean. This is a unique ratio which isn't just a mathematical curiosity. It gives rise to spirals in seashells, pinecones and other basic biological patterns. It is the principle of regeneration, of patterning based on building off what came before. As such, human reproduction is a process ruled by the Golden Mean. The key here is that, like the tzolkin, the Golden Mean is also found in planetary cycles. In fact, it was really the key to 17th-century cosmologist



Stela 11 from Izapa shows Cosmic Father in the "mouth" of Cosmic Mother, the "dark rift" or "birth canal" in the Milky Way. This is an image of the celestial alignment which culminates in A.D. 2012.

Johannes Kepler's Harmony of the Spheres model of the cosmos. Contrary to what latter-day historians of science usually say, Kepler's model worked perfectly well for all the visible planets. The point here is that the tzolkin number 260 is directly related to the Golden Mean. The Golden Mean is usually approximated as 1.618, and is symbolized by the Greek letter ϕ ("PHI"). Here's the connection: $100\phi^2 = 261.8$. As far as theorems go, this is tolerably close to 260. The Mayan sacred number 260 is, I believe, referential to the principle of the Golden Mean. I explore all this very thoroughly in my book *Jaloj Kexoj and PHI-64* (1994). So, yes, the tzolkin provides the logos-pattern or Morphic Field which human beings can choose to synchronize with by performing ritual in tune with the inner

dynamics of the 13 numbers and 20 day-signs. In doing so, we can understand our deep interweaving with the cosmos.

RP: You write in your book *Journey to the Mayan Underworld* that the day-glyphs of the Sacred Calendar are "...the guardians of dormant faculties within our minds... doorways to the cosmos... energy entities." Please elaborate. How can one contact or utilize such glyphic beings? Have you correlated and mapped them to the Chi power points on the human body? If so, how?

JMJ: This statement is based on the fact that the Maya associate the 20 day-glyphs with the 20 fingers and toes. To me, it seemed that the 20 fingers and toes represent the extreme ends of the body-image, the antenna you might say. I don't know where the fingers and toes get placed on charts of the cerebral cortex showing what area corresponds to which body part, but I felt that if a twenty-day bio-rhythm exists, the full circuit covers all the bases.

This relates to the well-known fact that the 20-day month is called *uinal*, and the related word for human being is *uinac*. Some kind of correlation must have been recognized. Since the fingers and toes in this interpretation are thus the extremities, and each day-glyph archetype is located at these points, to open each portal over twenty days seemed a way to open up the "doorways to the cosmos." This is all just philosophical speculation on my part — I've never myself worked with the day-glyphs to such a degree, but I suspect

Mayan day-keepers and shaman do something like this when they divine for the location of lost objects and so forth. They call upon the help of the current day-god to channel through the answer. Opening up the day-glyph doors can connect you to information in the outer world.

Daykeepers have a body map which helps them interpret messages from the higher realm. This might be understood as working with Chi and certain power points on the body. They call it "lightning in the blood." In reading through the day-signs during a divination, they may feel an inner twinge in, say, the left calf. They take into account the day-sign they were at when it occurred, and the specific meaning of the left calf. "Left" would be something female, and I'm unsure what the calf means. As with all oracles, it's a pretty complex methodology and depends a great deal on the skills and gifts of the particular daykeeper. Mayanist scholars Barbara and Dennis Tedlock are both trained daykeepers. Dennis writes about some of his divining experiences in a very engaging way in his recent book *Breath on the Mirror*.

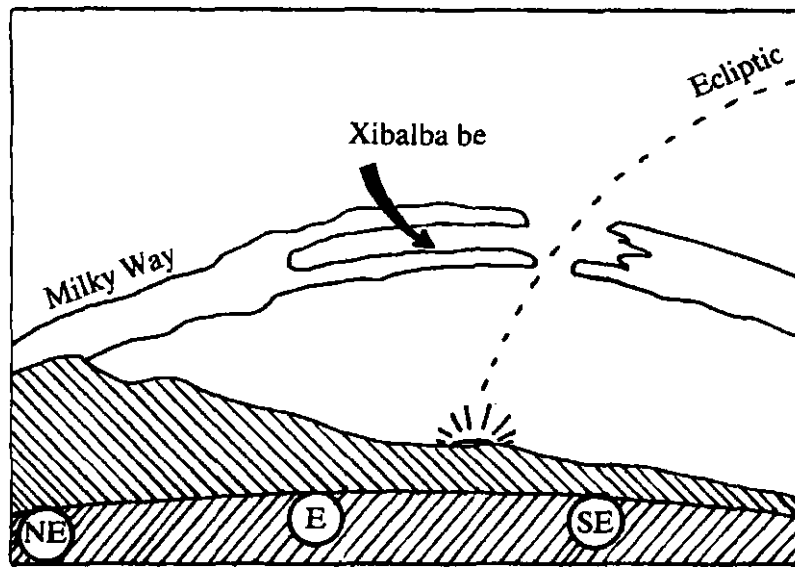
RP: Have you ever had a reading done?

JMJ: Not directly for myself. I've discussed the techniques with trained daykeepers, read ethnographic accounts and so on. I witnessed, in Chichicastenango in 1990, what you would probably call an exorcism.

RP: In your booklet series called *The Center of Mayan Time*, you discuss the Mayan Long Count end-date (December 21st, 2012 A.D.). What is this about?

JMJ: Many researchers have tried to figure out why the Mayan Calendar ends on December 21st, 2012 A.D. The Long Count calendar breaks time into cycles labeled baktuns, katuns and so on. The full 13-baktun cycle of the Long Count lasts just over 5125 years. Scholars have been able to place the beginning and end of this cycle

in relation to our own calendar, and that's why we know for sure the end date in 2012 A.D. Most researchers have thought that the beginning commemorates some mythic event, a convocation of gods or something, and that the Long Count's placement is thereby derived. But the end-date has always intrigued me, because it does end on the winter solstice. This tells me that the Maya targeted the end-date as the occurrence of some event rather than the beginning. But why 2012? The answer is startling in its simplicity, but has gone unexplored by Mayanists. The Maya



Izapa 50 B.C.

were intent stargazers; Mesoamerican astronomy is so complex there are thousands of volumes in libraries on this topic, thousands more to be written, and we just don't know yet what the limits of their astronomical knowledge was.

Now, in 1969 a book came out called *Hamlet's Mill* and the authors explored the role of a subtle celestial process called the precession of the equinoxes in the development of Old World astronomy and science. They mention the fact that at the turn of this coming millennium, there will be a rare alignment in that astronomical cycle. The winter solstice meridian will coincide with the Galactic Equator — the Milky Way. In other words, the winter solstice sun will be right on the Milky Way circa 2000 A.D., and the alignment has been slowly converging for thousands of years. Precession is a subtle, very slow movement of the heavens, and it takes at least 100 years of observational records and a great deal of careful attention to notice it. My point is that the ancient skywatchers who devised the Long Count some 2100 years ago had discovered precession, and looked to the future alignment as a likely World Age

shift. They calculated the event and fixed their creation mythology to it. There are two more celestial features right near where the sun will be on the end-date in 2012 A.D.: 1) The "dark rift" which the Maya call "the road to the underworld." This is a dark area running along part of the Milky Way caused by interstellar dust clouds; and 2) The Galactic Center. In many mythological contexts, the "dark-rift" is understood to be the birth canal of the Great Mother, the Milky Way. It is the birth place of the next World Age. The celestial cross defined by the Milky Way crossing over the ecliptic is also important, and this was recently identified by Mayan scholar Linda Schele as the Mayan Sacred Tree. The heart of the four directional symbolism is the fifth direction, the center. This is the navel and source of creation. And again, the "dark-rift" runs through all these features. All of these mythic symbols are different, but are very close together in the sky. When the winter solstice sun, who is a "First Father" deity, comes along and gets born, you have a rare celestial event highlighting a unique era in human civilization. The strange thing here is that this "womb of creation" imagery seems appropriate in real terms because the nearby Galactic Center is really the birth place of everything! The question is whether this is all fairy tales or are there real effects of the alignment? The field orientation of the earth, sun and greater galaxy are definitely inter-related. This may be more about immediate field shifts rather than cause-and-effect energy emanating from the Galactic Center. Maybe it's a little of both. When the solstice meridian passes through the Galactic Equator, a rare era in the earth's journey is engaged. How does this effect human society? Maybe it sets the stage for earthquakes and volcanoes and pole shifts and so forth — the recurring Atlantean cataclysm myths may be based in this 26,000 cycle. Maybe it's just a paradigm shift, a cycling of psychological dominants as Jung would say.

RP: If one views the tzolkin as a sort of macromorphic powerstation which itself emerged from the Sacred Tree, then what do you think is in store for us on and following the end-date/Creation Day? Does the conjunction point to the emergence of a new morphogenetic power station, perhaps?

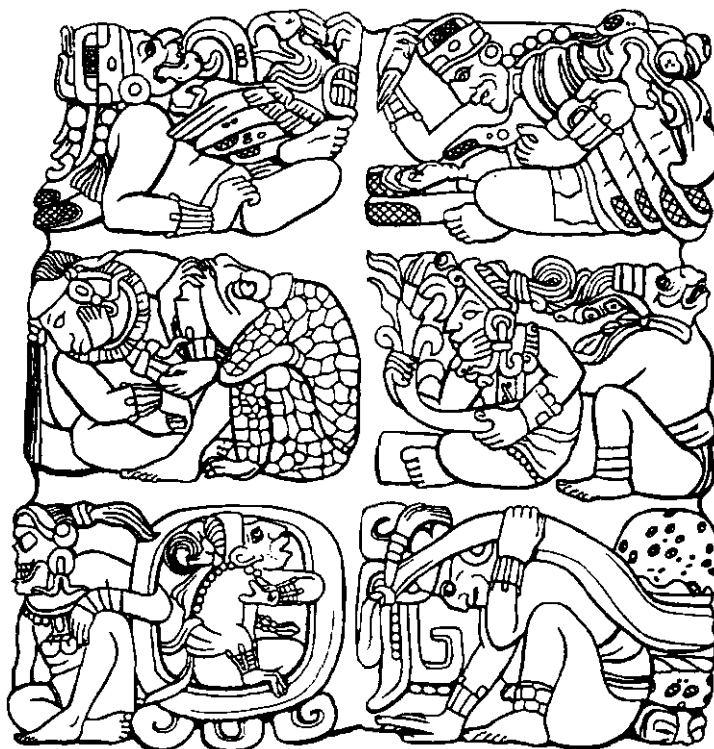
JMJ: To answer your last question first, I don't think that the powerstation itself will be replaced or altered. I think that the Galactic Center is probably the powerstation. The phenomenon that periodically aligns us with this power station, via the winter

solstice meridian, is the precession of the equinoxes. The Long Count calendar seems to take into consideration the precessional movement and tells us when the next alignment will occur: 2012 A.D. The "dark-rift" aspect is intriguing, because it is a visible feature of the Milky Way, while the Galactic Center is not. So, it's rather intriguing that the Maya mythologized the dark-rift as a navel or birth canal — a cosmic origin-place if you will — because that's exactly what the nearby Galactic Center really is. It's the source of everything as far as the local neighborhood is concerned. So, the last time the winter solstice sun aligned with the dark-rift (with Galactic Center very close by) was about 26,000 years ago. This is an excellent event to mark the beginning of a new precessional cycle. I think we, as an evolving species, get a boost of some kind. I think energy is intensified, channeled in and focused somehow. This creates the crazy and intense scenario of modern life, a frenzied

chaos of mutations, death, new life, apocalypse and rebirth. Maybe new information comes through and reformats our spiritual hard drives. We could use it. It might be a Kali scenario — Kali in her destructive aspect — where the hard truth of the matter is that our time's up, the slate gets wiped clean and Ma earth rests before she has another kid. I'm not convinced that we even have a choice in the matter. Futurists sometimes present a heaven or hell option, saying that we live at a crossroads and it's up to us to either embrace the light and enter eternity or keep munchin' potato chips and end up bobbing for apples with Lucifer. But just think, bumbling along in unconscious stupor got us this far, to where we are upright and uptight, thinking, thumb using vegetarians.

Maybe whatever happens is just dandy. I don't know.

And what's going to happen on the end-date? I think that it's really happening now. Sometimes we forget that we live in a very unusual time. 100 years ago, horse drawn carts delivered your milk in the morning and now, a blip later, your average factory worker can easily own a supercomputer. If Russia had an IBM 386 at their disposal back in 1950, we would probably be calling each other comrade. In 2012, I think there will probably be celebrations, media hype, people getting rich off of selling T-shirts and so forth. And a big party, lots of big parties. Maybe in a hundred years our descendants will consider this a great era of transformation and new beginnings. Maybe 2013 will be year 1 in the new calendar. It might be some kind of nightmare of trans-national feudalism, with Newt Gingrich hailed as a demented founding father. My own ideal scenario is that we hear the message that the alignment expresses.



The event seems to be a reminder that everything springs from the Mother-principle. We need to relinquish the dominator style which has been our collective habit for almost 6000 years, and revert to the style that held us steady for tens of thousands of years prior to that — the partnership ideal of our Great Mother worshipping Neolithic ancestors. The alignment says that First Father (the winter solstice sun) is born from the birth canal of the Great Creatrix — the dark-rift in the Milky Way or, equally so, the Galactic Center. Woman embodies the first principle of life and continued life. The situation as seen in all our social norms and institutions is backwards. Dominator culture is life destroying. Partnership culture is more complex, more challenging, it introduces a third element into the picture — that which gets created in between. Mother equals Life. If we refuse to remember this, our culture becomes like a cancer, if it hasn't already. Turned upside down, the world can only go on for so long.

RP: How do Arguelles's "galactic beam" and "mass enlightenment" concepts fit into this?

JMJ: Arguelles's "galactic beam" idea and his other phrase "galactic synchronization" suggest that he was aware of the alignment. He seems to be intuitively tuned into this amazing fact of the end-date. But I have never read anything by him just spelling out what this alignment is. Never. Is there intentional obfuscation of the celestial mechanics of this? Is the high truth seen as fit for only the inner initiates, and this truth needs to be dished out to the masses in watered-down form? I don't buy that. We must network our thoughts, look at the various questions that arise in exploring the nature of this alignment, not decide how to package and sell it. Likewise, Mayan scholars have yet to explore the ramifications of the simple fact of this end-date alignment.

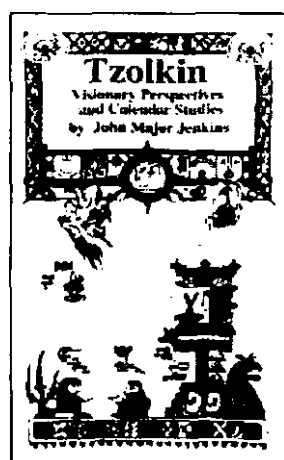
RP: Discuss the current state of affairs regarding academic acceptance of your work.

JMJ: Basically, there's been no response from key people I've contacted. The one exception, however, is promising. Barbara and Dennis Tedlock were here in Boulder last June for a conference at Naropa, and I was able to speak with both of them, albeit rather briefly. I had already sent them my 110-page monograph on the end-

date and several shorter, more concise essays, including the piece that *Mountain Astrologer* published last December. All well documented and plainly presented. They were thus familiar with my work and seemed open. In fact, when they were in Boulder the previous year, I had confronted Dennis with the fact of the alignment, and he admitted he had noticed that, but didn't know how to approach it. He said there was a potential problem with "misplaced concretism," referring to the fact that the alignment can't actually be empirically observed — because the sun is right there! But this isn't relevant, because the real question is whether or not the skywatchers who devised the Long Count 2100 years ago were tracking the slow convergence something that can be observed. Because of the unlikely coincidence of calendar and fact, it seems they were. I think the real taboo on the subject is that it brings up so many astounding implications that for a well-established scholar to dive into it is equivalent to aborting your career. This is where I step in, because I just deliver Chinese food — nothing to lose and probably nothing to gain either. Barbara signed her book with "looking forward to further dialogue." So these are very tuned in people, both of them apprenticed daykeepers, and I hope to speak at greater length with them next year.

RP: What is the nature/subject of your current work?

JMJ: Basically, I'm focusing on getting this information out. I'm setting up a website devoted to Four Ahau Press research. *Mountain Astrologer* might be publishing a follow-up article of mine on the end-date called "Mayan Cosmogenesis: Cosmic Mother Gives Birth." I'm continuing to dig through the academic literature looking for supporting evidence — and finding it. It's there. This is what I call literary archaeology. All the data and information is there — it just hasn't been pieced together yet. So a main concern is building a solidly documented case for conscious intent on the part of the ancient skywatchers in figuring this all out. Then even scholars will have to begin looking at this scenario. In fact, I'm beginning to suspect that it was a very ancient and common knowledge in Mesoamerica — the all pervasive core myth, you know, the First God emerging from the "cave" of creation. In some strange time-reversal fashion, the astronomical apotheosis of this myth was to occur in the far-off future, a future which for us is very near. □



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HYDROGEN POWER

Science Fact or Science Fiction?

by Patrick Armstrong

HYDROGEN is the lightest and most abundant element in the universe as well as the source of all energy. Deep within the sun and stars, nuclear fusion converts hydrogen into helium. The energy that is released when four hydrogen atoms become a helium atom is the energy which fuels all life. Evidence of the incredible amount of energy contained within a hydrogen atom is the thermonuclear or hydrogen bomb, which exploits nuclear fusion to release its destructive power.

In our natural environment, hydrogen exists primarily in combination with other elements. In order for hydrogen to be useful as a fuel, it must exist as H_2 or "free hydrogen." H_2 must therefore be produced, unlike fossil fuels such as natural gas, coal and oil which can be directly mined or extracted. In this sense, hydrogen is a secondary source of energy, analogous to electricity. The energy used to produce H_2 is stored, with some losses, within the H_2 molecule. This energy can then be kept in storage, used on-site, or transported to a remote location for energy conversion. The fact that hydrogen must be produced is a major consideration when examining its effectiveness as an energy carrier, and is the biggest stumbling-block to widespread use in commercial applications.

Free hydrogen exists at normal atmospheric conditions as an odorless, colorless gas. It is stable and will co-exist harmlessly with free oxygen (O_2) until an input of energy drives the exothermic (heat-releasing) reaction which forms water. This reaction from a higher energy state to a lower one generates a positive output of energy. For over a century it has been predicted that a system will be developed in which hydrogen, extracted from pure water using energy derived from the sun, is used as a fuel or as an "energy-carrier," and will serve to provide the demands for all of society's power requirements. The beauty of the system being that solar energy and water, the sources, are practically limitless and that the resulting energy conversion is relatively pollution-free with the only waste product being pure water. A seemingly perfect cycle, beginning and ending with energy and water.

In 1870, Jules Verne predicted with impressive foresight the use of hydrogen fuel in his Sci-Fi classic *Mysterious Island*. Verne describes a process whereby, "...water will one day be employed as fuel, that hydrogen and oxygen which constitute it, used singly

or together, will furnish an inexhaustible source of heat and light, of an intensity of which coal is not capable. ...Water will be the coal of our future." Where is this technology that has had 100 years to come to fruition? An examination of the history of hydrogen research as well as a look at today's research and development helps to provide some answers.

HISTORY

Probably the first recorded event of the production of hydrogen in the laboratory is contained within 15th century alchemical texts. The alchemists dealt extensively with the transmutation of metals, a procedure which required the dissolution of metals in salts or acids. At the time, the existence of the element hydrogen was unknown to the alchemists, although they were aware of the presence of something different in these metal/acid reactions. Theophrastus Bombastus "Paracelsus" (1493-1541) was purported to have said, when he dissolved iron in spirit of vitriol, "Air arises and breaks forth like the wind." He was most probably referring to the production of hydrogen. Still, little was understood of the gas' properties. Its burnability was not noted until the 17th century by Turquet de Mayerne.⁴

It was the common belief in 17th century Europe that air itself was a basic element. Some perceptive individuals suspected that there existed a property of air which was required for the combustion and the sustenance of life. Some important figures involved in this quest were the Dutch physician Herman Boerhaave (1668-1738), the English scientist Robert Boyle (1627-1691) (who developed Boyle's Law) and the English physician John Mayow (1645-1679) all of which were outspoken in their belief in a "life-giving" substance within air.

It was also believed that there existed a substance called phlogiston which imparts burnability in matter and that combustion was the release of phlogiston. This theory was first published in 1697 by the German scientist Georg Ernst Stahl (1660-1734). Henry Cavendish (1731-1810), believing in the existence of phlogiston, attempted to describe some of its properties. He succeeded in isolating carbon dioxide (CO_2) and hydrogen gas (H_2) and dubbed them "fixed air" and "flammable air" respectively. He was able to obtain precise measures of hydrogen's specific weight and density, although he thought he was studying

a pure state of phlogiston. Cavendish also discovered that igniting a mixture of flammable air and oxygen (air) produced water. These were to be pivotal investigations into the properties of hydrogen.

The French chemist Antoine Laurent Lavoisier (1743-1794) continued the study of flammable air, repeating Cavendish's experiments, and eventually produced hydrogen and oxygen in the laboratory via the dissolution of metals in acid. He was also able to split water molecules using a heated copper tube. In another experiment he combined hydrogen and oxygen and produced water. These experiments, in 1785, were to prove definitively that H_2 and O_2 are the basic constituents of water. It was his important publication, *The Method of Chemical Nomenclature*, in which Lavoisier named the "flammable air" hydrogen, and the "life-sustaining air" oxygen. Lavoisier was eventually executed after the French Revolution in 1794 because of his associations with the pre-Revolution French government, a loss heavily mourned by the international scientific community of the day.

The discovery that "flammable air" was fourteen times lighter than air led to the use of hydrogen as a bouyant in aeronautical balloons. A French physicist Jacques Alexandre Cesar Charles (1746-1823) was the first to use hydrogen in a balloon known as a "Charliere," in which he was able to fly to an altitude of 3km in 1783 (use of hydrogen continued on into the 20th century, eventually being replaced by helium due to its inert properties, thus reducing chance of explosion).

Soon after Alessandro Volta built his first electric cell near the turn of the century, two English scientists, William Nicholson and Sir Anthony Carlisle, discovered that by passing an electric current through water, hydrogen and oxygen could be produced. This process, called electrolysis, was to become an important method for the production of hydrogen. In 1839, Sir William Groves was able to reverse the process, combining hydrogen and oxygen with platinum electrodes and a sulfuric acid (H_2SO_4) electrolyte to produce electricity and water, inventing the first fuel cell.

Early in the 19th century, the Reverend William Cecil presented a paper to the Cambridge Philosophical Society entitled, "On the Application of Hydrogen Gas to Produce Moving Power in Machinery." Basically, the paper described a hydrogen-powered engine in which hydrogen and oxygen were combined and ignited. The ensuing vacuum generated a moving force via the air that rushed in to fill the void. Although there is no record that the engine was actually built, Cecil's proposal pioneered the study of hydrogen's use as a fuel.

On into the 20th century, hydrogen's development as a fuel source had achieved little progress until the Scottish geneticist J.B.S. Haldane presented a paper to Cambridge University in which he proposed that Britain could meet its increasing demand for energy by using wind energy to electrolyze water into hydrogen and oxygen. The gases, first liquefied, can be stored in underground reservoirs until needed. They can then be recombined in combustion motors or "oxidation cells." This

paper, presented in 1923, offered a glimpse into the potential of a solar-hydrogen fuel system. At a time when the use of fossil fuels, especially coal, was prevalent, Haldane emphasized the scarcity of fossil fuels and the eventual necessity of an alternative source of energy.

Haldane also pointed out that liquid hydrogen has three times as much heat per pound of hydrocarbon fuel. This is an important factor when developing hydrogen fuel for use in air and space travel, where weight is of a prime design criteria. However, the lightness of hydrogen allows for only about one-third of the energy per unit volume. An aircraft using hydrogen will be able to fly higher and farther due to the lighter fuel load than an aircraft using the energy-equivalent amount of jet fuel.⁴ ¹³ The tanks, however, must be much larger and take up to one-third of the fuselage in current designs for commercial aircraft.⁴

In the 1930's, interest in hydrogen as a fuel reached a new height. In Germany, two men were extremely influential in hydrogen research; Franz Lawaczeck and Rudolph Erren. Lawaczeck, a German turbine designer, was sketching designs for hydrogen powered cars as early as 1919.⁴ His work, in collaboration with the German-American J.E. Noeggerath, and the German inventor Hermann Oberth, led to ideas for developments in efficient pressurized electrolyzers, liquid hydrogen use as a rocket fuel, and the transportation of hydrogen in pipelines for use as an energy-carrier.

The most influential pioneer of the 1930s would undoubtedly be Rudolf Erren. An expert in the combustion process, Erren began developing hydrogen engines in the late 1920s. He advanced the concept of injecting hydrogen into the air-fuel mixture of combustion engines, serving to heighten the output of the combustion process. Erren, working in cooperation with the German, Australian, and British governments, converted buses, vans, rail cars, and even submarines to be powered by hydrogen or any combination of hydrogen-fuel mixtures.⁴ ⁷ However, a conflict of interests brought about by World War II, made it impossible for Erren to work with both the British and German governments and Erren's efforts to expand the technology were fruitless. Eventually the government research money was cutoff and Erren's research fell into a period of disquiet.

Other important developments of the 1930s included the work of the German engineer Hermann Honnef, who designed huge wind-power generators which could theoretically produce up to 100 megawatts of power, stored as hydrogen. Although they never went beyond the drawing board, Honnef's ideas were predecessors to much of the wind-turbine technology used effectively today.⁴ ¹³

Hydrogen was also being used to supplement fuel in large dirigibles in both Germany and England. In the 1920s and 1930s, before switching to helium, hydrogen was the primary bouyant used in large passenger balloons. These "Zeppelins" were able to fly to altitudes of 2400 feet at 75 mph. The fuel used to drive the motors was typically a benzol-gasoline mixture. In order to maintain proper bouyancy, the captain was required to blow off hydrogen as fuel was consumed. An innovative solution was to

combine the blow-off hydrogen with the main fuel in the internal-combustion engines. In this way they were able to decrease fuel consumption.⁴ England also used this strategy in their R101 airships, and were also able to reduce the requirements for hydrocarbon fuel.

Zeppelins are still what people most associate with hydrogen, and the Hindenburg disaster is probably the most well-known event involving hydrogen. The Hindenburg's association to hydrogen has created a negative public image of the gas, and has perpetuated the myth that hydrogen is extremely dangerous. The Hindenburg was actually designed to use helium as the bouyant. At the time of the ill-fated journey to New Jersey, helium was extremely hard to come by due to U.S. trade embargoes. They used hydrogen, the next best thing, but the ship was not equipped with the necessary safety features required to deal with the flammable gas. The explosion was well covered by the media at the time. Little known is the fact that most of the deaths (there were thirty six casualties) were not attributed to the actual explosion, but occurred when many tried to jump to safety and died on landing. It is now established that hydrogen is, in fact, less dangerous than most fuels used today.¹⁰

In the United States, I.I. Sikorski, who developed the first working helicopter, was looking into the use of hydrogen as an aircraft fuel. In 1938, he presented his ideas to the American Institute of Electrical Engineers, suggesting that the use of liquid hydrogen would permit, "... a great change, particularly with respect to long-range aircraft..." "This would make possible the circumnavigation of the earth along the equator in a nonstop flight without refueling. It would also enable an increase in the performance of nearly every type of aircraft." His statement would prove prophetic in the years to follow.

The next decade saw little in the way of forward progress in hydrogen research and development, presumably due to the distractions of World War II. Any existing collaborations between German and English scientists disintegrated, and funding went elsewhere. The only significant events were the redistribution of fossil-fuel resources, which led many countries to start looking for sources of domestic energy. This factor contributed directly to the work of J.S. Just in Australia, who found that hydrogen, produced via off-peak electricity, cost roughly the same per mile as gasoline in trucks.⁷ Plans were made to develop commercial-sized electrolysis plants, but were scrapped after the Allied victory in 1945 made oil available and cheap once again.

One Australian who continued hydrogen research was R.O. King, who relocated to the University of Toronto in Canada to further the cause. From 1948 to 1955, King led his team of scientists at the University of Toronto to conduct numerous studies into the use of hydrogen as an alternative to gasoline in ordinary internal combustion engines. They were able to show that hydrogen was indeed feasible in this capacity, the primary constraint being that the compression ratio in the engines had to be kept below seven to one¹³. These studies in Toronto showed that combustion engines can be converted to run on hydrogen simply and cheaply.

During the same period, the British scientist Francis T. Bacon began development of the hydrogen-air fuel cell. This fuel cell, called the Bacon Cell, substituted an alkali (potassium hydroxide (KOH)) for the acid as the electrolyte, eliminating the problem of corrosion of the electrodes. The Bacon Cell was used as the model fuel cell which was to become an integral part of NASA's space program.

In the 1950s, the U.S. Air Force was using hydrogen fuel in experimental high-altitude, long-range reconnaissance aircraft. Based at the NACA Lewis Research Center in Ohio, the Air Force converted a B-57 to run on liquid hydrogen. The pilot had the option to switch from the conventional kerosene fuel source to hydrogen. This was fed under pressure from the wing-tip fuel tank to a heat-exchanger where the cryogenic liquid was heated to a gas and burned normally in one of the two jet engines. Although the program was a success, the use of other fuels proved to be more cost-efficient, and the use of hydrogen as an aircraft fuel was discontinued.

At the same time, Lockheed, in conjunction with Pratt & Whitney, was developing a high-altitude, supersonic spy plane to run on liquid hydrogen fuel. This plane, the CL-400, got as far as wind-tunnel testing before the program was discontinued for technical and logistical reasons. A large amount of drag was introduced due to the larger volume requirements of liquid hydrogen storage. This required more power to keep the plane in flight. One positive outcome was the determination that liquid hydrogen did not require more safety precautions than that which were required for hydrocarbon fuels. This is an important step in helping to dispel the "Hindenburg Myth."

Lockheed and NASA have since continued development of an advanced supersonic transport (AST) using liquid hydrogen fuel (LiQH_2). Studies in the tradeoff of reduced fuel consumption with LiQH_2 versus increased drag have shown that the LiQH_2 AST would still be 43% more efficient (environmental advantages also play a part in the consideration, with reduced carbon emissions, less noise, and lower NO_x emissions).⁴ Still, the final considerations are economic, and hydrocarbon fuels are still cheaper than hydrogen, when production, storage, and transportation are accounted for. Until the scarcity of fossil fuels makes their price increase to a higher level, government support of LiQH_2 aircraft will be lacking.

In the 1960's NASA developed the use of the hydrogen fuel cell for use in the Apollo missions to the moon. The fuel cells, utilizing expensive platinum electrodes, provided electrical power on-board, as well as generating drinking water for the crew's consumption. It proved to be a highly reliable system and is still used today in the Space Shuttle missions.

Also, during the 1960s, an Australian electrochemist John O'M. Bockris, while working as a consultant with General Motors, began advancing the idea of a "hydrogen economy." In this ambitious energy concept, the cities of the United States could be supplied with energy derived from the sun, and the energy stored using hydrogen. GM studied the use of hydrogen for a time, yet did not pursue the technology to any significant

degree. Bockris continued his crusade, and the phrase "hydrogen economy," which has nothing to do with economics, has become an important concept.

In 1966, 16 year old Roger Billings modified a model-A Ford to run on hydrogen. Billings went on to convert many late model automobiles to run on hydrogen using their internal combustion engines. In 1972, he won the anti-pollution category of the Urban Vehicle Design Competition with a hydrogen-fueled Volkswagen. Billings soon teamed up with other interested parties to form one of the most influential advocates and developers of hydrogen-fueled automobiles, the Billings Energy Corporation of Provo. He has demonstrated the feasibility of hydrogen use in buses and mail trucks. Roger Billings is still in the forefront of hydrogen technology, speaking out and demonstrating the advantages of hydrogen use in transportation and home appliances. Since that time, literally hundreds of automobiles have been converted to run on hydrogen.

The "energy crisis" of 1973 produced a major impetus for a renewed interest in alternative fuel sources. The OPEC situation and the realization that fossil fuels were not only running out but environmentally undesirable, led to a shift in public opinion. The renewed public interest was so strong that it generated an incredible amount of publicity. Most of the major publications printed stories about hydrogen. Articles appeared in *Business Week*, *Readers Digest*, *Time*, *Scientific American*, and *Fortune*. Hydrogen had become a popular solution to the prevailing urgency to find a source of domestic energy.

The upsurge in interest led to the formation of advocate groups. The H₂indenburg Society, formed on the 35th anniversary of the Hindenburg disaster, was dedicated to the "safe utilization of hydrogen as a fuel." The purpose was to educate and dispel many of the myths which deemed hydrogen to be a dangerous, useless substance. Originally an informal group, popular interest led to the necessity for the formation of the International Association for Hydrogen Energy in 1974. Another important group, the Institute of Gas Technology, also played an important role in generating public awareness and support for hydrogen research. Other associations that have sprouted up since then include the American Hydrogen Association and the National Hydrogen Association.

Great gains were made in the research of hydrogen in the 1970s, but interest waned in the decade to follow. The reason was once again economics. Hydrogen was still too expensive. Although the environmental aspects were appealing, they could not outweigh the fact that natural gas, oil, and coal were much cheaper and easier to use. Also, the "crisis" in the Middle East dissipated when OPEC loosened its grip, and the price of oil leveled off.

Most advances since the 1970s have been made using hydrogen in motor-driven vehicles, either in conjunction with other fuels, or used in electric vehicles. Since 1982, Georgetown University has been developing a fuel-cell/battery-operated bus. The buses have been used in California, Washington D.C., and Chicago with favorable results. Canada's Ballard Power Systems

developed a 20-passenger bus to run on a hydrogen fuel-cell. Daimler Benz, in Europe has also developed vehicles which run on metal hydride storage systems. A press release dated May 14, 1996, gave details of a newly unveiled fuel cell vehicle available to the public. The NECAR II fuel cell vehicle has room for six people. The fuel cells produce an output of 50 kW and enable a top speed of 110 km/h. The range of the vehicle, on full hydrogen tanks, is more than 250 kilometers.¹

Daimler-Benz has also mentioned development of an automobile that will produce hydrogen on-board, using methanol. A successful method of producing hydrogen "on the go" would be a major step in hydrogen evolution, and would create a revolution in transportation, even if hydrocarbon fuels are still used.

Other automobile manufacturers, such as Mazda and Renault, have developed hydrogen powered vehicles, although none have been slated for public availability as of yet. Some U.S. companies, pushed by stiffer environmental legislature, and deadlines to produce "zero-emission" automobiles by the year 2000, have increased the push to make available a hydrogen-powered passenger vehicle. There is little evidence that the American automobile manufacturers are able to meet any of the environmental goals set by State and Federal legislatures. Whether this is technical inability or a conflict of interests is unclear.

In the United States, recent legislation has paved the way for hydrogen programs. In 1990, the Spark M. Matsunaga Hydrogen, Research, Development and Demonstration Act (PL 101-566) led to the enactment of a 5-year management and implementation plan for hydrogen research and development. The Hydrogen Technical Advisory Panel was established for coordination and consultation.

The Energy Policy Act of 1992 (PL 102-486) authorized the Department of Energy to administer the five year R&D program. In accordance with the Matsunaga Act, the program would include investigation into renewable production of hydrogen, transportation of hydrogen via existing natural gas pipeline systems, hydrogen storage for vehicle use, and fuel cells for hydrogen powered vehicles.

The Hydrogen Energy Research Program was introduced in the Hydrogen, Fusion and High Energy and Nuclear Physics Research Act of 1994. The bill authorized \$134 million over four years. The main goal is the demonstration of the practicability of using hydrogen in transportation, industrial, residential, and utility applications by the year 2000. The bill passed the House but did not pass the Senate. The Hydrogen Future Act of 1995 was a toned down version of the original bill which reduced the emphasis on demonstration projects, and instead focussed more on R&D. The bill passed congress and is now in effect with much funding going into R&D.

Today, interest in hydrogen seems to be on an upswing once again. Recognition of the benefits of hydrogen has reached a global scale. The continued demonstration of the attainability of a renewable, clean-burning fuel has captured public awareness, and has won the support of those governments which aid in funding research and creating infrastructure webs.

PRESENT TECHNOLOGIES

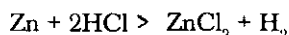
There are four processes which must be considered when developing a hydrogen-fuel system. These processes are:

1. Production
2. Storage
3. Transportation
4. Energy conversion

There are many alternatives from which to choose when developing a hydrogen system. The factors in which each alternative is considered, involve efficiency, economic feasibility, and environmental impacts. How these factors are weighted against each other is open for debate. Currently the prevailing trend is to consider cost-effectiveness above all else. Recent trends in legislature and public concern are shifting emphasis more towards renewable and pollution-free considerations as a priority for development of hydrogen technology.

Hydrogen is a secondary source of energy, not a primary source like oil or natural gas. Therefore, in order to be utilized hydrogen must first be produced. There are many ways in which hydrogen can be produced. Methods of production include chemical, electrochemical, photochemical, biological, and thermochemical processes.

The simplest method to produce hydrogen is to dissolve metals in acid. For example, when zinc (Zn) is placed in a solution of hydrochloric acid, it reacts to produce zinc chloride and hydrogen.



This reaction can be reproduced simply in the laboratory, although the amount of hydrogen produced is minimal. Still, this method was used to a large extent during World War II when scrap aluminum was dissolved in sodium hydroxide (lye) in order to generate hydrogen. The hydrogen was then used to inflate unmanned balloons for weather observation and raising radio antennas.¹³ This method is relatively expensive, and is not considered a method for mass production (today, research is being done with scrap iron to produce hydrogen, for use in transportation as a method of producing hydrogen onboard). Small amounts of hydrogen can then be economically produced to provide the needs of a small hydrogen-fuel system.

The cheapest, and by far the most widely used method for producing hydrogen is steam reformation. Steam, and a carbon-based feedstock (usually methane or natural gas), are combined under high temperature and high pressure to produce carbon dioxide and hydrogen. It is estimated that 95% of hydrogen produced in the US is by the steam methane reformation method.⁸ Most of this hydrogen is used in industrial applications. Although hydrogen can be produced in this manner for about \$0.65 per kilogram, the environmental consequences of the use of hydrocarbons are still a concern. The production of carbon dioxide, a "greenhouse gas," as well as nitrogen oxides (NO_x)

contribute to the pollution of the Earth's atmosphere. Also, the limited resources can only make the cost increase as the supplies of fossil fuel sources decrease. A newly developing renewable option is the use of biomass, or recycled carbonaceous material, as the feedstock in the steam reformation process. The air pollution problems still exist, but it will be an intelligent use of a waste product.

Another method for producing hydrogen is electrolysis. Electrolysis involves the application of a small voltage (approx. 2V DC) to pure water. The electrical energy decomposes the water molecule into its constituent elements, hydrogen and oxygen. This technique has the advantage of producing hydrogen directly from water, with none of the environmental drawbacks which accompany processes using fossil-fuels. Still, the relatively low-efficiency (currently 60-65% with a theoretical maximum of 85%) of the process, and the high cost of electricity make this an expensive option.¹⁰ The cost of producing hydrogen via electrolysis is about \$3.00 per kg.⁸

The method of electrolysis is the most attractive for those interested in a completely clean, renewable process using solar energy to produce the electricity. Photovoltaic cells, hydropower, and wind turbines are currently being used to generate the electricity required to electrolyze water for hydrogen production.^{5,6} Other renewable options include geothermal, tidal, wave action, and thermal gradients in the ocean. Although most of these processes do not produce sufficient amounts of energy to provide hydrogen on a large scale, on-site electricity production coupled with a small on-site electrolyzer can produce enough energy to provide for the energy needs of a household along with fuel for the family automobile. This allows hydrogen to be produced easily without having to wait for an infrastructure to develop.

Other attempts at water-splitting have involved super-heating water to temperatures high enough to liberate the hydrogen from the water molecule (thermochemical). The temperatures required are in the range of 5000° – 6000° F. Adding chemicals such as sulfuric acid can lower the required temperature but the bottom line is that the only feasible way of generating the heat required is by way of a nuclear reaction. Nuclear power generation, needless to say, has severe safety implications. There is still research being done in the thermochemical production of hydrogen which doesn't require nuclear power plants. An example would be solar power plants in which the heat of the Sun is focused into a tiny point where the heat accumulates, much like a magnifying glass. Yet there are still environmental concerns due to the chemicals involved, and the nitrogen oxides which are formed from a heat reaction in air (which has a high concentration of nitrogen).

Photoprocesses involve the use of light energy for the production of hydrogen. These methods in one way or another, attempt to mimic the natural phenomena of photosynthesis. In plants, chlorophyll captures light energy and uses it to produce complex sugar-phosphate compounds. The most astonishing fact is that this chemical reaction, basically $\text{CO}_2 + \text{H}_2\text{O} + \text{light energy} >$

sugars + O_2 occurs at room temperature! Much research has been done to reproduce this feat. Photobiological techniques which coax photosynthetic plants, algae, and bacteria into respiring hydrogen, photochemical techniques which synthetically duplicate the photosynthetic process, and photoelectrochemical techniques which use layers of semiconductors separated by water are being researched today.^{4,8} These are promising technologies, but are still in the experimental stage. If efficiency improves, then photoprocesses may play a part in the future of hydrogen.

STORAGE AND TRANSPORTATION

Hydrogen is typically stored as a liquid, or as a gas. There are advantages and disadvantages to each of these storage options, the choice of which depends upon the ultimate use.

Hydrogen becomes a liquid at temperatures below $-423.13^\circ F$ ($-252.9^\circ C$). Liquefaction of hydrogen is very energy-intensive, with one-third of the energy content of the hydrogen used in the liquefaction process.¹⁰ This is offset by a reduction of volume requirements for hydrogen storage, with much less storage space required for a liquid than a gas. Less volume needed for storage, makes liquid hydrogen the preferred form of hydrogen used in the Aerospace industry with NASA being one of the largest consumers of liquid hydrogen in the world.^{4,12}

Once in liquid form, hydrogen can be transported in pressurized tanks by truck, barge, or rail. Due to the very low boiling temperature of hydrogen, losses due to boil-off can be considerable. Insulation of the tanks is of utmost importance to reduce these losses. If insulated properly, hydrogen can be stored for as much as five years without significant losses.^{9,10}

Hydrogen can also be stored as a pressurized gas. As a gas it can be transported via pipelines, using existing natural gas distribution lines. A concern would be possible embrittlement of the lines due to absorption by the metal fittings. Storage of hydrogen as a gas is the most economical method, but due to the necessity for larger tanks, weight and space requirements can be a problem. It is estimated that the mass of a pressure tank is 100 times the mass of the hydrogen stored within it.¹⁰ Higher pressure means less volume required,

but the walls need to be reinforced to withstand the greater pressure. Although hydrogen is extremely light, the containers necessary to store gaseous hydrogen can be heavy and bulky.

Another method of storing gaseous hydrogen involves metal hydrides. Certain metals such as magnesium, titanium, or iron, have an affinity for hydrogen. Under certain conditions, these metals will absorb gaseous hydrogen, and store it within its molecular structure. When the hydride is heated, the hydrogen is released. Although energy is required to store and to release the hydrogen, this option has proved attractive for use as a storage medium onboard automobiles. The main reason is that it is much less energy-intensive than the liquefaction process, although heat energy is required to release the hydrogen.⁴ Also,

safety and space concerns are reduced when metal hydride storage is used in automobiles.

There are a variety of other methods being developed for hydrogen storage. These include carbon adsorption, glass microspheres, onboard partial oxidation reactors, and recyclable liquid carriers. Some of these options appear promising, but they will still take some time to develop.

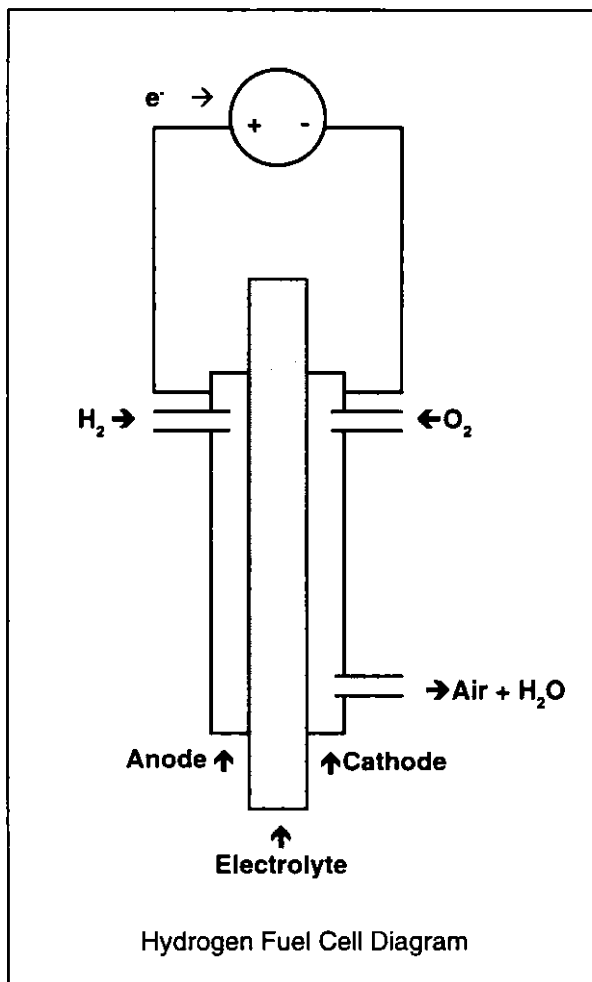
POWER CONVERSION

There are two ways of using hydrogen to generate power. One is simple combustion. The use of hydrogen in internal combustion engines has been used extensively. The other is the conversion of hydrogen into electricity in a fuel cell, which is essentially electrolysis in reverse. Both of these have their advantages and disadvantages.

Internal combustion engines can be easily converted to run on hydrogen, or a hydrogen-fuel mixture.^{7,10} The noxious emissions are greatly reduced, with water being the only by-product if pure hydrogen and oxygen are used. Nitrogen oxides are still formed from the high heat of combustion,

and are still a source of air pollution.

Over the past two decades, most research has gone into the development of the fuel cell. The operation of a fuel cell involves the combination of hydrogen (anode) and oxygen (cathode) in the presence of an electrolyte. Output voltages range from 0.7 to 1.12 V.¹⁰ The type of fuel cell varies depending on the electrolyte used. Fuel cell types include the Phosphoric acid fuel cell, the alkaline fuel cell, and the solid oxide fuel cell. The most common



type, the alkaline fuel cell, is still used by NASA on board spacecraft.⁷ Another type of electrolyte being developed is the proton-exchange membrane which uses a solid polymer to facilitate the reverse electrolysis process. This solid polymer, which is much like plastic kitchen wrap, conducts protons, and is very conducive to the purpose of an electrolyte. Although membrane costs are high, this type of fuel cell appears very promising, and is currently being used in advanced research (Schatz Lab, Humboldt State University, California).

The use of hydrogen is at an all-time high. It is possible to convert any car sitting in the driveway to run on hydrogen. It is being proven every day that hydrogen can be used as a replacement not only for gasoline, but natural gas in heaters and stoves in the home. Hydrogen could some day replace electricity as the primary energy-carrier via high-voltage power lines, being transported in pipelines and converted to electricity on-site.

Production of hydrogen is also becoming easy to do for anyone with access to about 2V of DC electricity. Many homesteads generate enough electricity using windmills and solar panels to supply the household's needs. A small electrolyzer added to this system could easily produce enough hydrogen to fuel a vehicle. It is clearly possible that anyone with a little ingenuity and skill can convert the household to use hydrogen, convert the car to run on hydrogen, and generate the electricity for hydrogen production using only solar energy, all for about the cost of a mid-sized American sedan.

Any in depth study of hydrogen reveals the vast array of system configurations for hydrogen power. The bottom line is that any system which utilizes hydrogen in any capacity is going to be better off for it. Harmful emissions are reduced, efficiency is increased and water (the original source), is produced. On a larger level, it would seem possible that use of hydrogen alone or in conjunction with other fuels would be a major step in the right direction, and bring us a little closer to a more harmonic cycle of energy use. □

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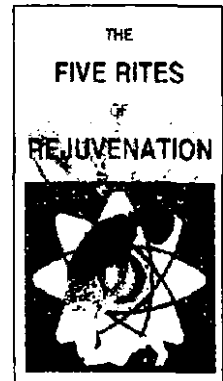
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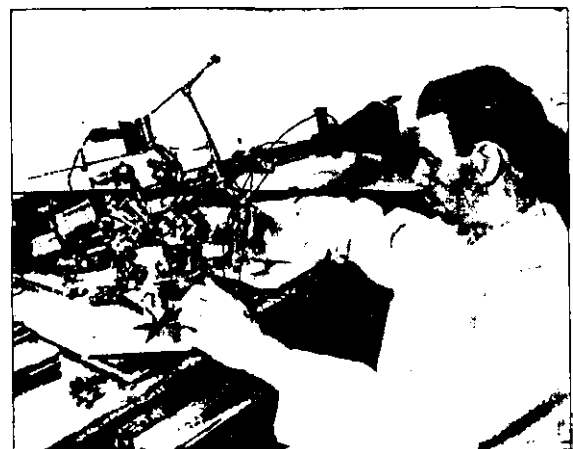
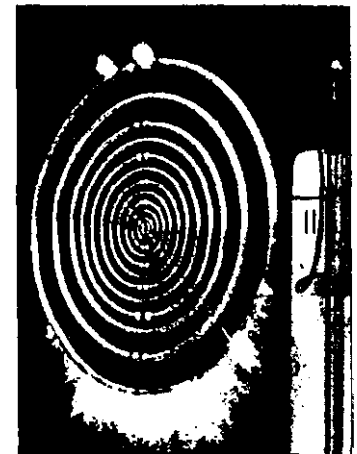
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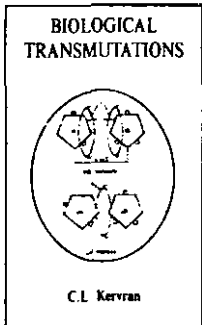


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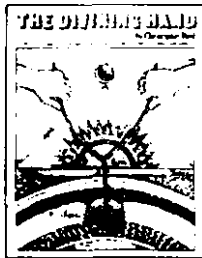
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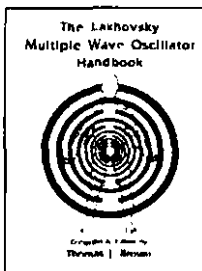
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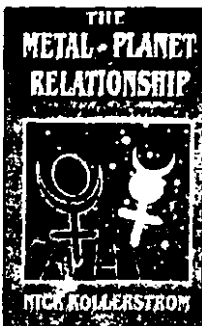
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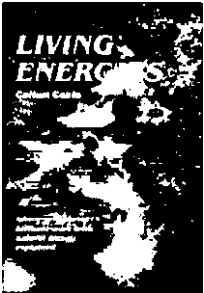
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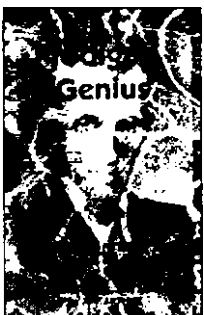


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The Pundit Curmudgeon

Thoughts Caused By Attending Two Conferences

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THE expression "renaissance man" is commonly used to designate a person living in the period extending between the 14th to the 17th centuries who was able to know about everything there was to know about a wide variety of subjects because the knowledge of the period was quite limited. Such an individual is to be envied. At times it would be a delight if the sum total of human knowledge could be shrunk down to the capacity of a human mind. Of course, if this should happen, we could be in deep trouble because of that proportion of the benefits of the current vast technological explosion which would be lost during the volume reducing process.

This bit of philosophy can be attributed to — no, blamed on — the efforts of the U.S. Psychotronics Association in connection with its July 12-14, 1996 conference, and the Tesla Society's 1996 International Tesla Symposium held July 18-21, 1996. Both meetings were jammed with good, bad, and debatable information beyond the mental digestive capacity of a normal individual. And, to a non-objectionable degree, they had the same speakers.

Early in the year circumstances apparently permitted me to plan to attend both conferences on a trip primarily planned to indulge and get to know my grandchildren, and to impose upon friends and relatives. When complications precluded the achievement of these objectives, I faced gaining nothing from the discounted, prepaid attendance fees by canceling the trip. Since something is usually, but not always better than nothing, I attended both meetings. Probably this was a mistake.

As a result of this activity, my mind became an undesirable overflowing witches' cauldron of confused, overlapping, and often contradictory thoughts on both subjects of and of no personal interest. The Psychotronics and Tesla conferences were suggestive of the proverbial two peas removed from next to each other in the same pod. At times it is difficult to distinguish these and other related conferences without examining them in detail. While there were material differences in the conferences I attended apparently there are more significant differences in the organizations sponsoring them.

The latter were reflected in their meetings. In general the Tesla Symposium seemed to be further from being lost in the clouds than the Psychotronics conference. It gave the impression of being aimed at practical, tangible hardware to a greater degree than the Psychotronics meeting. Both conferences included a variety of tantalizing "extras" which tended to materially add to the enrollment fees required to attend them. Anyone thinking of attending future meetings corresponding to those I attended should clearly understand that the fees charged to attend them are not the complete costs. Both groups tantalize you into spending more money to enjoy the equivalents of old time circus side shows.

It appeared that the Psychotronics Association was an entirely volunteer, clique-managed, well meaning group, which made little or no effort to monitor the quality and content of the material presented at the conference, other than in connection with subject matter of particular interest to its management clique. While the same statements may apply to the Tesla Society, my observations at its meeting gave rise to the impression that this is not the case. I came away from the Tesla conference with the impression that the sponsoring society was probably operated in an essentially business like fashion under the domination of a controlling type personality who functioned with the assistance of one or more at least part time paid assistants, and a multitude of volunteers.

Probably a consequence of the organization of the Tesla group was that the presentations at the Tesla Conference seemed to be well regulated. This had the effect of avoiding inappropriate speeches which would not appeal to the diverse interests of those attending the conference. Those speeches given at the Psychotronics meeting at times seemed to digress from the prime interests of those present. Too many of the presentations at the latter were, in my opinion, a tragedy. Perhaps it is fortunate that I cannot comment on a number of the presentations at the Tesla symposium as a result of getting too sick to attend them.

At the Psychotronics conference the interests of its controlling clique in radionics was inescapable. Members of a committee, which apparently included the obvious members of this clique, could not hold back effervescing over those in attendance about taking a trip to England in an effort to understand and resurrect the De La Warr "camera". While their activities in doing this are to be commended, and hopefully will continue, it is questioned if there was adequate background preparation for the trip. At no time did I hear or see any evidence that the members of the committee were adequately familiar with and understood De La Warr's "theories" as manifested in his camera.

A continuing strong emphasis of the Psychotronics group on radionics was evidenced by its efforts to promote and teach college level courses in radionics. Last year it gave such a course under the simulated college designation "RAD 101" and extended such efforts

this year by offering a more advanced course "RAD 102" as an add-on to its conference. Although this RAD 102 course has some merit, the less I say about it the better. It was essentially a course in the use of the well known SE-5 machine which omitted any significant or extensive mention of the existence of other types of radionics equipment.

While this SE-5 device has a justified and honored reputation, it is not "the" radionics device for all time. Other competitive equipment is, and has been available and new developments—particularly developments relating to the use of a stick plate will soon make it as an apparatus which is used merely because the user is familiar with it or cannot afford the latest piece of equipment. The fact that the SE-5 is being by-passed was briefly demonstrated during the RAD 102 "course" by reference to what can be classified as an improvement of the SE-5 device, and by at least one exhibitor at the conference advocating a different type of machine.

This particular exhibitor was a Mr. Gordon Smith of ACT Ltd., Maperton Stud, Wincanton, Somerset, BA9 8EH, England. The device demonstrated by him included a notebook sized computer which was coupled to the hand of a user by a simple connection of a band containing an electronic component. At this point the software of the computer took over and rapidly monitored the operation of the latter's body while concurrently and sequentially applying a computerized form of every homeopathic remedy which was apparently located at the time the software was prepared.

This device was the most impressive new development which I observed at the Psychotronics conference. After the conference, but prior to writing this column, I could not avoid having restricted reservations about the "system" demonstrated by Mr. Smith. Does it in fact "work"? These reservations are based on the fact that on my returning from the conferences, an outgrowth of activity with a friend, was the discovery that a photograph taken with a Casio electronic camera and printed out on an office machine type color printer can not be substituted for a traditional Polaroid photograph in operating an SE-5 machine and, apparently, in various operations of traditional magic.

The consequences of this discovery are significant in connection with the concepts of magic and are still being investigated. If an electronically represented image such as a photograph is, in fact, of no utility in at least one application of traditional magic, can we expect computer versions of homeopathic compositions to retain the effectiveness of the real compositions? Mr. Smith apparently believes that they do retain their operative character. I hope he is correct.

Whether those controlling the Psychotronics Association liked it or not, their conference seemed to be permeated—and to a degree directed—toward the subject of diagnosing and treating the human body. The same type of statement can be made relative to the Tesla Symposium. Is this wise in view of the operative specter of the FDA's wrath descending on the valiant spirits seeking progress in the medical field?

Our Government's attitude seemingly is to increasingly hinder drastically needed improvement in the "legitimate" but outdated health care "establishment", while protecting vested and anticipated financial interests in the latter field without concern for the consequences of this conduct. At both of the conferences mentioned there seemed to be a somewhat repressed, justifiable fear of the power of

both Federal and state authorities in guarding against any possibly needed improvement in the treatment of the human body.

At the current Tesla Conference there was a clear indication of a reason for such fear. Last year a dentist, Dr. Huggins, lectured a conference corresponding to that presented this year. At the time his message was to the effect that current and traditional dental procedures such as the use of mercury based fillings and root canal treatments had the potential of harming some individuals, and that there had been some unspecified number of cases of such harm. In connection with this he presented what seemed to be an extremely good case against the use of mercury amalgams in filling teeth because of the toxicity of mercury. As a part of the presentation he referenced current Federal regulations regarding the handling of this metal because of its effects on a human body.

This year the same Dr. Huggins was back at the Tesla Conference. According to his statements at this meeting he had been stripped of his license as a dentist because of those statements he made at the Tesla gathering in 1995. Apparently whatever agency licenses dentists in Colorado had an unannounced agent listening at the prior Tesla meeting who reported on Dr. Huggins' remarks to this licensing authority.

My notes indicate that Dr. Huggins said that these statements formed the basis for his losing his license to practice because they unduly tended to unnecessarily alarm the public, and, more specifically, those who had been treated in the ways which Dr. Huggins considered to be undesirable. The effect on Dr. Huggins of this loss of his license must have been, and be continuing to be, devastating. As one who has several professional licenses, I can "feel" the mental agony of losing them in impliedly disgracing circumstances even though I am now technically retired. The frustration he must feel as a result of having lost his license, and being saddled with the social stigma of one who has been kicked out of his professional position for what he considers to be an exercise of "free speech", must be devastating.

In understanding what apparently happened to Dr. Huggins it is prudent to recall that none of our so called "freedoms" such as the freedom of speech set forth in the Bill of Rights means exactly what it says. Any conduct which will give rise to a "clear and present" danger such as yelling "fire" in a crowded theater when in fact there is no fire can, and should be, precluded even if it appears to be permissible under the Bill of Rights so as to protect against the danger of damage from such conduct. There are many examples of when individual freedoms need to be restricted to avoid the consequences of various types of objectionable conduct.

In most of these examples the critical factor in determining whether or not to terminate conduct apparently permissible in the exercise of a "freedom" relates to the question of the damage which will result if the conduct is not stopped. "Freedoms" such as freedom of speech are normally only thwarted when there is objectionable conduct which is reasonably apt to cause damage of such a character that is incapable of being adequately counter balanced by money. Any organized society needs the right to take such action as is reasonably necessary in order to avoid the damage caused by the abuse of a traditional freedom.

You can judge whether or not it is proper by this type of criteria to cost a person such as Dr. Huggins a professional license necessary to practice his or her profession for merely speaking an apparently

legitimate opinion at a meeting such as that of the Tesla Conference or that of the US Psychotronics Association. How could there have been any "clear and present danger" in connection with the presentation of his opinion? There are several lessons to be learned from what happened to Dr. Huggins and others who have preceded him. Those who read *Borderlands* will be familiar with the names and stories of many of these others such as Dr. Reich, Dr. Drown, and others who have challenged authority and vested interests.

Such rights as US citizens have are often more illusory than real. In effect in the US a person is automatically charged with and convicted of a "semi-crime" when he or she is charged with the commission of an actual crime. The penalties for this conviction of the semi-crime are the costs, tensions, and frustrations of providing a defense to the crime charged, in many cases at least a temporary loss of or damage to property, and the possible complications of having been booked. Often these also include the frequent social stigma of being improperly being presumed guilty of the actual crime because of the criminal charge even if a court finds the person involved innocent. The authorities may not even care if a person is convicted of the charged crime since the agony of the defense against it is punishment for whatever conduct resulted in the person being charged with the crime.

The realization of the consequences of providing a criminal defense is often more than enough to teach the lesson that normally one should do nothing to attract the attention of any governmental authority. Both the Psychotronics and Tesla organizations seem to be devoid of the realization of the practical considerations of getting involved with "the law" to the extent that they are jeopardizing the future ability of legitimate investigators to obtain and use for non-medical purposes many items which at least in theory have dual medical and non-medical utilities.

As a consequence of bad draftsmanship classifying various items based on their use, and not their structure, the FDA assumes that it has the right to control the movement in interstate commerce (including commerce affecting interstate commerce) of all "medical" devices, even if such devices have a significant non-medical utility. For practical purposes a device is a medical device — for the purposes of the FDA — if any medical claims are made relative to the results of its use. At the Psychotronics and Tesla conventions this distinction was definitely ignored. This could lead to trouble, specifically if, as suspected, these conferences were "monitored" by someone representing the FDA.

It is sad that because of past statements concerning the treatment of the human body, many devices are not now freely available for use in the study of some aspects of magic, particularly those aspects of magic which are concerned with religion, studies concerning plants, bacteria and viruses, and physiological observations in connection with humans and other animals. It will be a tragedy if the continued indiscriminate reference to the use of the SE-5, and similar equipment for medical purposes, by organizations such as the Tesla Society or the Psychotronics Association will motivate an authority to cut off the availability of these items for non-medical investigations and uses.

There is good reason for believing that such difficulty can (or, perhaps, could have been) avoided by clearly stressing what devices such as the SE-5 really are. This statement is far from being a certainty. They, and many other related structures, are in fact

devices for making physiological measurements. Common polygraphs are examples of machines which are used for making such measurements which are not usually considered to be medical devices. While at least in theory they can be used to monitor blood pressure for the purpose of medical treatment, in reality, they are used to measure blood pressure as a guide to the judgment of an individual's veracity.

The measurements made with an SE-5 are, in fact, often used to monitor or determine one or more functions related to the life of a human or other animal in the same generalized manner in which a polygraph reflects a person's blood pressure. The measurements obtained with one of these SE-5 machines can be used in connection with plant growth or other subject matters, and detracts from their being considered medical devices, even though, in some limited circumstances, they have the potential of being used for a medical purpose — to the same extent that a common polygraph could be used as a guide to treating blood pressure.

It is stupid for any organization to make even implied medical claims relative to the SE-5 or any related device or structure when there is no need to make such claims. The Tesla Symposium was especially guilty of possibly operating in the area of FDA concern in connection with a lecture by Dr. Bare (which I unfortunately missed because of illness) on a modern version of the legendary Rife technology. Perhaps it is deliberately taking a reasonably unavoidable risk of a confrontation in doing this in furtherance of its perceived role in disseminating potentially useful but not yet established technology.

Both this and last year Dr. Rawls gave very "guarded" talks at the Tesla conventions concerning his work with magnetic healing. These were very carefully phrased as to avoid an undesirable confrontation with the FDA. Unfortunately his justified fear is causing the suppression of knowledge which should be known in spite of the FDA and the lethargy and vested interests of established medicine. The situation at the Psychotronics Conference was insidiously worse.

Those attending its convention heard at least one speaker admit that the attempts of the Psychotronics group to develop college level courses in radionics were intended to give radionics a "status" such as might be useful in blocking or defending against FDA, and perhaps other action, particularly if the prestige and/or authority of the Psychotronics Association tended to legitimate whatever might have provoked such action. In my opinion such attitudes amount to foolish stupidity. The Psychotronics Association appears to be too small and has such a limited influence as to be incapable of inhibiting well financed governmental action.

A number of presentations at both conferences gave the impression of having been scheduled as a consequence of advanced stupidity or, less probably, in the exercise of inspired foresight. Probably the most debatable of the presentations at the Psychotronics meeting was that of David Hudson. It seemed that the timing of the conference was rearranged on short notice to meet his convenience. After listening to him it was easy to see why. He gave a beautiful, convincing presentation on subject matter pertaining to alchemy. After he finished I happened to pass a group talking to him in a hall. Much to my surprise it was impossible to avoid hearing something about his seeking investments to build a factory. Later it was confirmed that my hearing was functional in picking up on this.

This set off a mental chain reaction. My first thoughts were to the effect that if I had a process for making any noble metal I'd be quietly practicing it in secrecy to a sufficiently restricted extent so as to avoid either individual or governmental attention, and that I would produce and claim to have mined, or otherwise legally acquired, only that amount of valuable metal which was sufficiently large to permit a moderate, non attention generating, non frugal life style, and which was extensive enough so that I could secretly benefit those groups or activities that I chose. My second group of thoughts concerned the possibility of even a rather poor con man extracting money from minds such as mine which are eager to accept nearly anything as truth until it is proven beyond any doubt to be clearly impossible.

The third event of this chain reaction concerned my wondering about the responsibility of an organization such as the Psychotronics Association, or the Tesla Society, to check out the veracity of its speakers. Obviously neither group would knowingly schedule a speaker wearing a large badge saying "I Am A Con Expert Intending To Fleece You". Neither can either group be expected to do a detailed investigation of each and every speaker at the conventions which they sponsor. As a practical matter a detailed review of the speakers at each of the conferences should be recognized as being beyond the financial and practical ability of the organization sponsoring it.

This is particularly the case since for the most part these individuals intend to speak on topics which are at or beyond the fringes of established religion and technology. Because experience has shown that some of such topics will become tomorrow's newly accepted technology it is vital that organizations such as the Psychotronics and Tesla organizations escape any sort of a gag order requiring them to vouch for their speakers.

Their activities are needed so as to avoid the losses and damages commonly achieved by authoritarian secrecy orders. This is particularly the case when such orders are entered because a minion is less apt to get in trouble by bottling up novel subject matter than by releasing knowledge of it.

The topic of secrecy orders is in a way suggestive of what seemed to be the high point of the Tesla Symposium — the lecture by Don Smith. Because of the subject matter there is always a chance that he may be devastated by the issuance of a secrecy order. Last year at the Tesla meeting he delivered a talk about a device he invented for obtaining a useful amount of electric power from the ambient world.

This year he was understandably happy to report that an improved device was being commercially accepted by the Japanese after his efforts to have it adopted in the US had failed. He indicated that we can expect to see and hear more about his developments by the end of the current year or early next year. If his predictions are correct it is my opinion that we can expect small to moderately sized "black boxes" to bring about an extensive social and technical revolution embracing the entire earth and having the potential of bestowing marvelous ecological benefits.

If these enthusiastic predictions are only partially correct probably we should be rushing to unload any electric utility, natural gas, and petroleum stocks we may own. I'm not racing to my stock broker since the inertia of change gives us time to see if his statements pan out. On the basis of his statements it is a fair guess that only real handicaps to a full and complete energy revolution will be the costs

involved in converting to devices based on his concepts, the rear guard actions by individuals and firms seeking to preserve the status quo, and, hopefully not, military and/or government efforts designed to maintain a military or economic advantage for a particular country or countries.

Don Smith did not make the remarks forming the basis of these conclusions in a flippant manner. He seemed to be justifiably and happily bragging. He talked like there was no question but that he had solved the problem of getting a usable amount of electric power from the ambient, naturally occurring, energy systems. And, if so, he has given reality to a multitude of dreams concerning misnamed "free energy" devices. Even the thought of doing this is to be commended.

From Don Smith's attitude there was no question but that during the Tesla Symposium he was living on the euphoria of the anticipation of unlimited funds, the Nobel prize, and other things associated with expensive living. It was equally apparent that his actions were directed to achieving as much income from his developments as possible. I hope that he drastically reduces his hopes and anticipations.

Virtually every time an inventor builds mental dream castles or attempts to squeeze every potential for income out of an invention, he or she risks an increased possibility of the loss of future income from the invention, and the possibility of incurring extremely large attorneys fees and other litigation expenses. This is usually because a manufacturer who cannot obtain, or cannot obtain at a reasonable cost, the right to use an important invention, has a strong motive to attempt to design around the inventor's coverage or to take the chance of winning appropriate litigation seeking to terminate or limit the inventor's protection under applicable trade secret and patent law.

No effort is being made in this discussion to tabulate the multiplicity of things that can go wrong for an individual inventor in connection with such protection. The most important of such protection is that provided in the US and abroad under various different national patent laws. In the US it was once common to facetiously state that the only valid US patent was one that had never been considered by the US Supreme Court. While this is an overstatement it is based on much more than a vestige of truth.

Although I have not the faintest idea as to precisely what Don Smith has done or is doing to obtain patent protection or as to how his invention relates to the "prior art" on the basis of experience it is possible to predict with about 99% certainty that any patent protection he obtains will have sufficient "defects" or "limitations" for an infringer to be able to advance a reasonable charge that any patent or patents he may obtain are invalid or unenforceable.

This may particularly be the case if for one reason or another anything important or critical to the achievement of the "best mode" of utilizing the invention is omitted from one or more patent applications. So many persons are working on and have worked on sequestering usable electric energy from the ambient that it would be quite surprising if one or more others haven't done approximately what Mr. Smith is doing. To a degree it seems that the achievement of any major invention is an invitation to a court fight. Often in these situations a party who is initially thought to be the second inventor of an invention turns out to be the first.

The work by others than Don Smith to obtain useful quantities

of energy from ambient or other unconventional sources often came up at the Tesla Symposium in various different manners. Cold fusion is apparently alive and well without any positive assistance by the DOE. There seemed to be a distinct lack of news concerning the originators of this topic. Apparently they continue under Japanese sponsorship in a nifty lab on the French Riviera. No information seemed available about some gentlemen from Texas who gave a promising presentation at last year's Tesla gathering about achieving useful amounts of power from the ambient. This lack was disappointing.

Mr. Patterson's versions of cold fusion are apparently very promising. It is interesting that his patent application apparently was handled by the USPTO on a special basis because of his age. It was freely indicated that the prime reason for his progress was not this, but related to the fact that he has, and is using his own money. This takes him beyond the influence of the DOE until such time as the DOE starts pressurizing those he must do business with in order to advance his concepts.

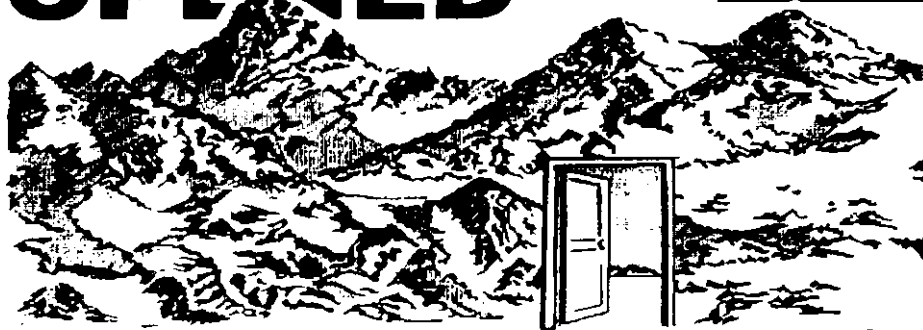
The DOE seemed to be primarily referred to at the Tesla Symposium in connection with various schemes for conserving hydrocarbon fuels through the use of various expedients. A few individuals of various degrees of technical sophistication recanted their lack of commercial success in connection with a number of expedients which would definitely save on the amount of gasoline we burn. It seems obvious that an intangible, rather warm place of religious significance will freeze over before the inertia and vested interests of our society will really do anything except treat the

general population and the world's ecology in a disreputable manner.

The preceding conclusion applies to other things than the use of hydrocarbons as an energy source. It is especially regrettable that it applies to all potential uses of magnets. The vast number of reports of magnetic energy saving fuel in internal combustion engines can hardly be ignored, but yet it is. Perhaps this is the result of inertia. Possibility it is related to the fact that many ways of using of magnets to save fuel are incapable of patent protection. Is this another demonstration that the DOE does not act when we would expect it to?

Other nasty insinuations growing out of the lack of the adoption of the use of magnets for agricultural, medical and many other treatments are the natural outgrowth of many of the remarks at both the Psychotronics and Tesla conferences. In general the virtues of magnetic treatments have been preached to such an extent that it would be a duplication of effort to repeat them. When the normally substantially unavailable benefits of various magnetic treatments, and many other rational new developments discussed at these conferences are considered, it is easy to get very discouraged about the future. Are those seeking progress and improvement at these and related conferences merely butting their heads against an immovable wall? □

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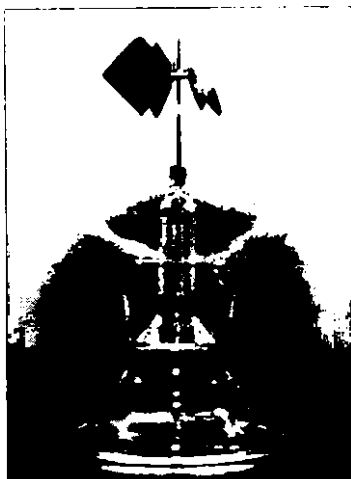
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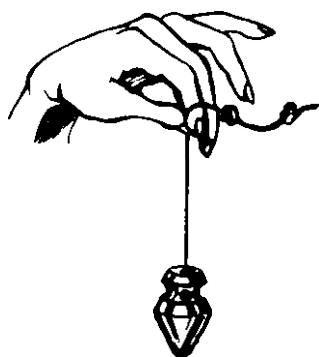
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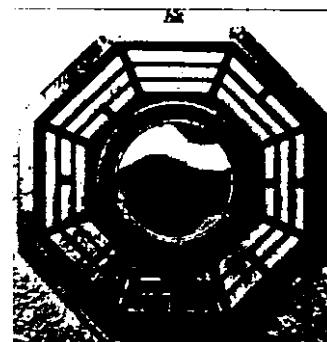


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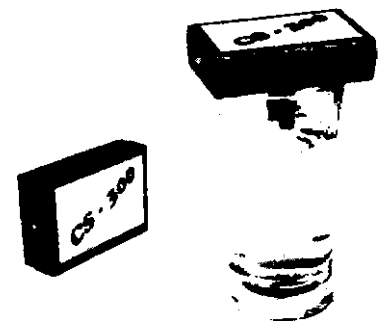
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